# GRADE LEVEL OF ACHIEVEMENT -2006-07 PILOT DATA

we engage

Alberta
EDUCATION

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**This document is intended primarily for:**
System and School Administrators
Education Stakeholders
Alberta Education Executive Team and Managers

**And may be of interest to:**
Teachers
Parents
Community Members

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# Executive Summary

This report conveys the outcomes of a value-added analysis of Grade Level of Achievement (GLA) data at the provincial level. GLA data reported to Alberta Education is a teacher's judgment of a students' academic progress. GLA is based on the learner outcomes in a subject area after a course for a specific grade level has been completed and reflects the results from the full range of classroom assessments. Given the comprehensiveness of classroom-based assessment, analysis of GLA data can provide unique insights into factors that influence student achievement. GLA data provides teachers, principals, central office staff and Alberta Education with an additional tool to help inform and engage students and parents in the learning process, and to analyze and evaluate the achievement of different populations of students to ensure that their learning needs are better understood and met. When GLA is reported to parents and receiving teachers this information benefits students by supporting accurate and timely communication of achievement information as they move from one grade to the next or between schools.

Alberta Education will use GLA data for program planning. The data is not used as part of the Accountability Pillar. The key purpose of reporting GLA is identifying students who are under-achieving, asking why and providing solutions both individually and systemically.

## Background

GLA pilots to demonstrate and build GLA reporting capacity were run in 2003-04 and again with a larger set of schools in 2005-06. Detailed analysis of the outcomes of these pilots supported the reliability and validity of the initial GLA data collection initiatives (Alberta Education, 2005, 2007) and provided support for continuing with the implementation of the GLA initiative.

This report describes the processes and outcomes associated with the 2006-07 Grade Level of Achievement (GLA) pilot data collection, data management and data analysis. Results of this and previous studies of GLA pilots will inform options for adjusting strategies for provincial implementation of the GLA reporting initiative. The current report demonstrates support for the four purposes for reporting GLA as defined in the GLA Handbook (Alberta Education, 2006:4), specifically:

- to provide richer information at the system level (both jurisdictional and provincial) to inform effective practices to determine the impact of specific programs on student learning (e.g., English as a Second Language, special education) and to determine processes to further refine these programs;
- as a catalyst within the school's professional learning community to focus on individual student learning needs and interests;
- to determine effective practices and strategies to foster higher levels of student achievement and confidence; and
- to contribute to the data or evidence used to report student achievement to parents/guardians, fulfilling the school's responsibility as outlined in the *Guide to Education: ECS to Grade 12* in the section entitled *Assessment as the Basis for Communicating Individual Student Achievement.*

**Study Limitations**

Reporting of GLA to Alberta Education in 2006-07 was expected by one-third of the Grade 1-9 schools in the province. This expectation was substantially exceeded with GLA data being submitted for the students in 60% of schools. The higher than expected number of students for whom GLA has been reported should still be treated with some caution, as there is still the potential for sampling bias which must be taken into consideration when reading this report.

The data used in this report were extracted from the data warehouse at the end of September in order to support the timely production of this report. Some GLA data has since been updated in the warehouse, that is, reports viewed on the Extranet by jurisdiction personnel may have slight variances with the results shown in this report.

**Key Findings from the 2006-07 Analysis**
- The degree of jurisdiction participation in the 2006-07 pilot was much higher than expected. A participation rate of 33 % was expected; however, the data submitted represents 60% of schools.
- The error rate for data submission was low with only 2.2% of the files submitted having errors.
- Compared to the 2005-06 data, the 2006-07 data demonstrates similar results for the total cohort and for specific sub-groupings of GLA data. Patterns of data distribution observed in 2005-06 with 82,000 students were also observed in the 2006-07 data.
- The data analysis demonstrates many interesting relationships. For example:
    - The large difference between Math 9 Provincial Achievement Test data and GLA data continues to be evident.
    - A much higher percentage of students coded as gifted are assessed above grade level in Math than in English Language Arts or French Language Arts.
    - When comparing foreign-born and Canadian-born students, both groups of students perform similarly in Mathematics but in English Language Arts, Canadian-born students are at an advantage.
    - Although a serendipitous finding, there is a disproportionate ratio of male: female severely coded students. There are nearly four times as many males as females coded as severely disabled.
    - When comparing GLA and PAT data, females outperform males in GLA to a statistically significant degree in both subjects in nearly all enrolled grades. The reverse is seen on the Math PAT results with males outperforming females to a statistically significant degree. In English Language Arts, females are outperforming males on the PATs.
    - A greater proportion of high mobility students (i.e. those who have changed schools more frequently than other students) have a GLA below their enrolled grade level.
- When examining mean GLA compared to enrolled grade, interesting patterns emerge:
    - Foreign-born and Canadian-born ESL students' GLA distributions are much closer together this year than was seen in the 2005-06 data.

- Foreign-born ESL students seem to have a GLA on par with their enrolled grade in Mathematics up until Grade 5. In English Language Arts the two measures diverge as early as Grade 2.
- The age effect[1] is apparent in English Language Arts in Grades 1 through 5. After Grade 5, the age effect tapers off and is no longer apparent. This relationship is more pronounced in the 2006-07 GLA data than in 2005-06, possibly due to the larger number of students in the 2006-07 data.
- There are moderate strength correlations between PATs and GLA (Grades 3, 6 and 9). This demonstrates a reasonable degree of concurrent validity of the GLA data.
- Using GLA and PAT information, GLA can provide important information for students that would not otherwise be available for students in grades not tested by PATs.

**How will GLA Information be used?**

- The GLA data is intended for use by Alberta Education, school jurisdictions and schools to better inform parents of their child's progress.

- Examples of Alberta Education data usage are:

  - To assist in planning improvements to provincial initiatives or programs and for curriculum evaluation.
  - To conduct further research into understanding how factors such as student gender, age, mobility and socio-economic variables influence student achievement and how interventions strategies can mitigate such negative effects. This research will be shared with jurisdiction staff to inform local strategies for improving student achievement.

- School jurisdiction and school usage include:

  - GLA data will help to ensure students and parents know and appreciate the grade level of the program of studies that the student has achieved. This information can also assist grade or school transitions so that programs are planned based on the demonstrated achievement to date.

  - Using GLA data as a benchmark, jurisdictions may wish to compare the data in school and jurisdiction GLA reports over time or in relationship to provincial norms. This can support conversations in professional learning communities regarding promising practices that have been demonstrated to improve student achievement in specific settings.

- In addition, GLA data collected by Alberta Education will be available upon request to schools as a backup if a student's record is delayed in transit or lost. This service will

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[1] Age effect is defined as older students in a grade tending to have higher average test scores than the younger students in that same grade when measured by the z-score of average PAT results for each birth month group (Alberta Learning, 2001).

help teachers ensure their instruction is geared to the student's instructional level and will help the student's transition to their new school.

**Next Steps in Implementation**

Current plans call for submission of GLA data in Language Arts and Mathematics by all Grade 1-9 schools in the province at the end of the 2007-08 school year. Plans are on track for receiving this data with zero errors. Production of GLA reports will provide schools and jurisdictions with analysis of their GLA data in relationship to their students' age, gender, mobility and a range of socio-economic variable that will assist staff in gaining additional insight into how these variables influence their students' achievement. These reports will be available via the Extranet to the submitting schools and jurisdictions by mid-October 2008. The provincial report summarizing the 2007-08 GLA data will have a strong focus on how well various programs are serving Alberta students.

# Introduction

This report describes the processes and outcomes for the 2006-07 Grade Level of Achievement (GLA) pilot data collection, data management and data analysis. The report is also intended to define the provincial context supporting the four purposes for reporting GLA as defined in the GLA Handbook (Alberta Education, 2006:4), specifically:

- to provide richer information at the system level (both jurisdictional and provincial) to inform effective practices to determine the impact of specific programs on student learning (e.g., English as a Second Language, special education) and to determine processes to further refine these programs;
- as a catalyst within the school's professional learning community to focus on individual student learning needs and interests;
- to determine effective practices and strategies to foster higher levels of student achievement and confidence; and
- to contribute to the data or evidence used to report student achievement to parents/guardians, fulfilling the school's responsibility as outlined in the *Guide to Education: ECS to Grade 12* in the section entitled *Assessment as the Basis for Communicating Individual Student Achievement.*

# Limitations of the Data

When analyzing the data, the following limitations were noted:

- In 2006-07, a much bigger sample than expected was submitted that is somewhat representative of the full population of Grade 1-9 students, however, some degree of sampling bias should be assumed.

- Generalizations should be considered in relationship to the estimated confidence intervals detailed on page 7.

# GLA 2007 Data Collection

Given that this was still a pilot year, a remarkably low number of data transmission errors occurred during this year's GLA data collection. Of a total of 228,150 GLA records submitted, there were 5,023 errors received (2.2%). The following table lists the number of errors by jurisdiction and the number of schools affected by these errors.

| Total Errors | # of Schools Affected |
|---:|---:|
| 1 | 1 |
| 456 | 1 |
| 6 | 3 |
| 34 | 1 |
| 949 | 3 |
| 3 | 1 |
| 1 | 1 |
| 37 | 1 |
| 4 | 1 |
| 2 | 2 |
| 3,358 | 120[2] |
| 162 | 8 |
| 8 | 6 |
| 2 | 1 |

The following list shows the types of errors that occurred as well as the number and percent of each type of error.

| Error Type | Number | Percent |
|---|---:|---:|
| Grade English Language Arts Introduced column incorrectly filled in for FLA students | 2,377 | 47.3% |
| Duplicate record of learner (i.e. two entries for the same person) | 1,417 | 28.2% |
| GLA/IPP codes not being exclusive | 1,175 | 23.4% |
| Incorrect GLA or IPP code | 48 | 1.0% |
| Learner's ASN (Alberta Student Number) not found | 6 | 0.1% |
| Total | 5,023 | 100.0% |

The Edulink software and manual used to transmit GLA data to Alberta Education has been upgraded to identify solutions to errors that exist in the data files when they are transmitted to Alberta Education. The GLA-Edulink Manual will be revised to require errors be corrected before the deadline for GLA data submissions. This step is expected to reduce the error rate to 0%.

The individual student records having errors were not included in the 2006-07 data throughout this report nor in the school and jurisdiction reports available on the Extranet. School authorities were advised of the specific error reports so they could accommodate the error rate in their interpretation of the value added GLA reports provided back to the jurisdiction and schools that submitted GLA data. A total of 5,023 files were excluded from the data analysis due to errors.

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[2] In this particular jurisdiction the bulk of the errors occurred in three schools, the remainder of schools had only one or two errors per school.

# Adjustments for GLA 2008 Data Collection

Quality control measures have been built into the Edulink reporting system. In 2007-08, jurisdictions submitting files that contain errors will be sent an automated email indicating the files containing errors. Files containing errors are to be amended and re-sent via Edulink by July 7, 2008.

# Description of GLA Data

A total of 923 schools from 71 authorities submitted useable Grade Level of Achievement data, reporting for 220,682 students, 3,380 of whom were not on a graded curriculum. The fields collected are as follows:

All Students:
- student name (surname and given name),
- Alberta Student Number, and
- enrolled grade, (defined as the grade to which the student was assigned).

GLA was collected for students on a graded curriculum as defined in the Alberta programs of study, in the following fields where applicable:

- GLA in English Language Arts
- GLA in French Language Arts - (French as the Language of instruction or Immersion students)
- GLA in Mathematics
- Grade English Language Arts Introduced

Grade Level of Achievement in 2006-07 is defined as the grade level expressed as a whole number in relationship to the learning outcomes defined in the program of studies that teachers judged the student to have achieved at the end of the school year. A GLA Handbook (Alberta Education, 2006) was developed and distributed in the 2005-06 school year to facilitate pilot school participation in GLA reporting.

The GLA Handbook encourages teachers to consider GLA assessment in relationship to the full range of formative and summative assessment information available to them over the course of the school year in making a professional judgment of the student's grade level of achievement.

Students not on a graded curriculum also had data submitted. "Not on a Graded Curriculum" was meant to indicate that the student's program was restricted to learning outcomes that were significantly different from the provincial curriculum defined in the program of studies and were specifically selected to meet the student's special needs as defined in the *Standards for Special Education* (Alberta Learning, 2004). The information collected was teachers' ratings of students' learning outcomes in three areas: communication skills, functional skills and academic readiness skills. "Communication skills" refer to the development of expressive and/or receptive communication. This could be verbal communication and/or alternative modes of communication. "Functional skills" refer to skills that would assist the student in developing

independence in the home, school and community. "Academic readiness skills" refer to skills that would prepare the student for learning outcomes in the programs of study.

Alberta Education staff used the Alberta Student Number to append data fields such as Provincial Achievement Test (PAT) results (both raw scores and achievement levels), student age, gender, number of school registrations, any additional special needs codes associated with the student, and starting date. Individual student identifiers were replaced with a discrete GLA data ID, leaving no personal identifiers in the dataset used in producing this report.

All Charter School Authorities were required to report GLA in Language Arts and Math for all students in Grades 1 to 9. Jurisdictions were required to report GLA in Language Arts and Math for a minimum of one third of schools in Grades 1 to 9. Many jurisdictions reported more than one third of schools in the 2006-07 school year. Seventy-one authorities submitted valid GLA data in the 2006-07 school year. The table below outlines the number of schools submitting GLA data in each jurisdiction.

Table 1 - Jurisdictions Reporting GLA

| Jurisdictions Reporting | Number of Schools (K-12) | Number of Schools Reporting | Percent of Schools Reporting |
|---|---|---|---|
| Almadina School Society | 1 | 1 | 100.0% |
| Aspen View Regional Division No. 19 | 15 | 5 | 33.3% |
| Aurora School Ltd. | 1 | 1 | 100.0% |
| Battle River Regional Division No. 31 | 34 | 10 | 29.4% |
| Black Gold Regional Division No. 18 | 26 | 7 | 26.9% |
| Buffalo Trail Public Schools Regional Division No. 28 | 28 | 21 | 75.0% |
| Calgary Arts Academy Society | 1 | 1 | 100.0% |
| Calgary Girls' School Society | 1 | 1 | 100.0% |
| Calgary Roman Catholic Separate School District No. 1 | 90 | 32 | 35.6% |
| Calgary School District No. 19 | 196 | 196 | 100.0% |
| Calgary Science School Society | 1 | 1 | 100.0% |
| Canadian Rockies Regional Division No. 12 | 6 | 6 | 100.0% |
| CAPE - Centre for Academic and Personal Excellence Institute | 1 | 1 | 100.0% |
| Chinook's Edge School Division No. 73 | 37 | 11 | 29.7% |
| Christ the Redeemer Catholic Separate Regional Division No. 3 | 13 | 5 | 38.5% |
| Clearview School Division No. 71 | 20 | 11 | 55.0% |
| East Central Alberta Catholic Separate Schools Regional Division No. 16 | 8 | 2 | 25.0% |
| East Central Francophone Education Region No. 3 | 4 | 1 | 25.0% |
| Edmonton Catholic Separate School District No. 7 | 80 | 31 | 38.8% |
| Edmonton School District No. 7 | 197 | 197 | 100.0% |
| Elk Island Catholic Separate Regional Division No. 41 | 16 | 5 | 31.3% |
| Elk Island Public Schools Regional Division No. 14 | 40 | 39 | 97.5% |
| Evergreen Catholic Separate Regional Division No. 2 | 8 | 2 | 25.0% |
| Foothills School Division No. 38 | 23 | 7 | 30.4% |

| Jurisdictions Reporting | Number of Schools (K-12) | Number of Schools Reporting | Percent of Schools Reporting |
|---|---|---|---|
| Fort McMurray Public School District No. 2833 | 12 | 11 | 91.7% |
| Fort McMurray Roman Catholic Separate School District No. 32 | 9 | 3 | 33.3% |
| Fort Vermilion School Division No. 52 | 18 | 5 | 27.8% |
| Foundations for the Future Charter Academy Charter School Society | 6 | 6 | 100.0% |
| Golden Hills School Division No. 75 | 40 | 20 | 50.0% |
| Grande Prairie Roman Catholic Separate School District No. 28 | 11 | 3 | 27.3% |
| Grande Prairie School District No. 2357 | 12 | 6 | 50.0% |
| Grande Yellowhead Regional Division No. 35 | 22 | 21 | 95.5% |
| Grasslands Regional Division No. 6 | 19 | 1 | 5.3% |
| Greater North Central Francophone Education Region No. 2 | 11 | 0 | 0.0% |
| Greater Southern Public Francophone Education Region No. 4 | 7 | 2 | 28.6% |
| Greater Southern Separate Catholic Francophone Education Region No. 4 | 3 | 3 | 100.0% |
| Greater St. Albert Catholic Regional Division No. 29 | 17 | 6 | 35.3% |
| High Prairie School Division No. 48 | 11 | 11 | 100.0% |
| Holy Family Catholic Regional Division No. 37 | 9 | 7 | 77.8% |
| Holy Spirit Roman Catholic Separate Regional Division No. 4 | 13 | 11 | 84.6% |
| Horizon School Division No. 67 | 33 | 6 | 18.2% |
| Lakeland Roman Catholic Separate School District No. 150 | 7 | 7 | 100.0% |
| Lethbridge School District No. 51 | 20 | 6 | 30.0% |
| Living Waters Catholic Regional Division No. 42 | 5 | 5 | 100.0% |
| Livingstone Range School Division No. 68 | 28 | 2 | 7.1% |
| Medicine Hat Catholic Separate Regional Division No. 20 | 10 | 3 | 30.0% |
| Medicine Hat School District No. 76 | 16 | 6 | 37.5% |
| Mother Earth's Children's Charter School Society | 1 | 1 | 100.0% |
| New Horizons Charter School Society | 1 | 1 | 100.0% |
| Northern Gateway Regional Division No. 10 | 20 | 7 | 35.0% |
| Northern Lights School Division No. 69 | 25 | 24 | 96.0% |
| Northland School Division No. 61 | 22 | 6 | 27.3% |
| Northwest Francophone Education Region No. 1 | 3 | 1 | 33.3% |
| Palliser Regional Division No. 26 | 32 | 20 | 62.5% |
| Peace River School Division No. 10 | 18 | 6 | 33.3% |
| Peace Wapiti School Division No. 76 | 29 | 7 | 24.1% |
| Pembina Hills Regional Division No. 7 | 20 | 5 | 25.0% |
| Prairie Land Regional Division No. 25 | 18 | 3 | 16.7% |
| Prairie Rose School Division No. 8 | 34 | 33 | 97.1% |
| Red Deer Catholic Regional Division No. 39 | 15 | 4 | 26.7% |
| Red Deer School District No. 104 | 29 | 8 | 27.6% |
| Rocky View School Division No. 41 | 37 | 16 | 43.2% |

| Jurisdictions Reporting | Number of Schools (K-12) | Number of Schools Reporting | Percent of Schools Reporting |
|---|---|---|---|
| St. Albert Protestant Separate School District No. 6 | 12 | 2 | 16.7% |
| St. Paul Education Regional Division No. 1 | 16 | 9 | 56.3% |
| St. Thomas Aquinas Roman Catholic Separate Regional Division No. 38 | 7 | 2 | 28.6% |
| Sturgeon School Division No. 24 | 12 | 4 | 33.3% |
| Suzuki Charter School Society | 1 | 1 | 100.0% |
| Westmount Charter School Society | 1 | 1 | 100.0% |
| Westwind School Division No. 74 | 29 | 4 | 13.8% |
| Wetaskiwin Regional Division No. 11 | 20 | 3 | 15.0% |
| Wild Rose School Division No. 66 | 16 | 5 | 31.3% |
| Wolf Creek School Division No. 72 | 30 | 5 | 16.7% |
| Total | 1,492 | 923 | 61.9%[3] |

[3] Provincially, 60% of all schools submitted GLA data. This table has excluded Parkland School Division that was exempted for 2006-07, Moberly Hall Charter school which closed, and Boyle Street Charter school that had no grade 1-9 enrolment from the school counts resulting in a higher percentage of schools submitting GLA data.

# Grade Level of Achievement – Summary of Results

## Students on a Graded Curriculum

There were 217,302 students on a graded curriculum included in this sample for the 2006-07 school year. The students are roughly evenly distributed by enrolled grade with approximately 11% of the students in each grade cohort. The table below shows the distribution of the GLA sample data by enrolled grade (Grades 1 to 9) compared to the Provincial[4] distribution.

Table 2 - Enrolled Grade Distribution

| Enrolled Grade Distribution | | | | | |
|---|---|---|---|---|---|
| Enrolled Grade | Frequency | Percent of Total | Province | Percent of Total | 95% Confidence Interval[5] |
| 1 | 23,692 | 10.9% | 42,176 | 10.6% | +/- 0.47% |
| 2 | 23,929 | 11.0% | 42,493 | 10.7% | +/- 0.47% |
| 3 | 23,896 | 11.0% | 42,656 | 10.7% | +/- 0.47% |
| 4 | 23,954 | 11.0% | 42,597 | 10.7% | +/- 0.47% |
| 5 | 23,839 | 11.0% | 43,858 | 11.0% | +/- 0.47% |
| 6 | 24,582 | 11.3% | 45,050 | 11.3% | +/- 0.46% |
| 7 | 24,240 | 11.2% | 45,544 | 11.5% | +/- 0.47% |
| 8 | 24,267 | 11.2% | 45,790 | 11.5% | +/- 0.46% |
| 9 | 24,903 | 11.5% | 47,014 | 11.8% | +/- 0.45% |
| Total | 217,302 | 100.0% | 397,178 | 100.0% | +/- 0.15% |

Students could have been coded as severely disabled, mild/moderately disabled, gifted or ESL. Those students who were not coded as any of those categories are termed 'non-coded'. The non-coded students make up the largest proportion of the sample as shown in the chart below.

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[4] In Tables 2 and 3, the "Province" columns refer to the data for the entire province. In the remainder of the report, provincial comparisons refer to the provincial sample of GLA data.

[5] The estimated confidence interval is expressed as a percentage and indicates how confident the researcher wants to be (e.g. 95% confident) that the data collected accurately represents the results of the entire population. The objective is to obtain a sample large enough to ensure a 95% confidence that the results will be within +/- 3% around the mean. In this report sample sizes are very large and provide a high degree of confidence that sampling error is minimal.

Table 3- Types of Student Codes

| | Type of Student Codes | | | | |
|---|---|---|---|---|---|
| | GLA Totals | Percent of GLA Total | Provincial Totals | Percent of Provincial Total | 95% Confidence Interval |
| Non-Coded | 170,637 | 77.9% | 313,612 | 79.0% | +/- 0.17 |
| Severe Disabilities | 5,303 | 2.4% | 12,576 | 3.2% | +/- 0.86 |
| Mild/Moderate Disabilities | 16,769 | 7.7% | 30,835 | 7.8% | +/- 0.56 |
| Gifted | 3,314 | 1.5% | 5,221 | 1.3% | +/- 1.31 |
| ESL –Canadian-born | 11,795 | 5.4% | 18,690 | 4.7% | +/- 0.69 |
| ESL – Foreign-born | 11,139 | 5.1% | 16,244 | 4.1% | +/- 0.71 |
| Total | 218,957* | 100.0% | 397,178 | 100.0% | +/- 0.13 |

*This is higher than the total in Table 2 because some students have double codes.

The distribution of students in each of the GLA results categories by subject is shown in the table below.

Table 4 - All Students, Provincial

**All Students – Province**

| | Mathematics | | English Language Arts | | French Language Arts | |
|---|---|---|---|---|---|---|
| | Number of students | Percent of total enrolled (%) | Number of students | Percent of total enrolled (%) | Number of students | Percent of total enrolled (%) |
| GLA below enrolled grade | 21,348 | 9.8% | 24,116 | 11.1% | 741 | 5.8% |
| GLA equal to enrolled grade | 190,426 | 87.6% | 185,148 | 85.2% | 10,758 | 84.8% |
| GLA above enrolled grade | 1,027 | 0.5% | 540 | 0.2% | 45 | 0.4% |
| GLA NA[6] | 4,501 | 2.1% | 7,498 | 3.5% | 1,142 | 9.0% |
| Total | 217,302 | 100.0% | 217,302 | 100.0% | 12,686 | 100.0% |

Table 5 - Students Non Coded, Provincial

**Students non coded (as mild/moderate, severe, gifted, or ESL) – Province**

| | Mathematics | | English Language Arts | | French Language Arts | |
|---|---|---|---|---|---|---|
| | Number of students | Percent of total enrolled (%) | Number of students | Percent of total enrolled (%) | Number of students | Percent of total enrolled (%) |
| GLA below enrolled grade | 10,443 | 6.1% | 11,248 | 6.6% | 587 | 5.1% |
| GLA equal to enrolled grade | 156,991 | 92.0% | 154,046 | 90.3% | 9,947 | 86.5% |
| GLA above enrolled grade | 619 | 0.4% | 452 | 0.3% | 36 | 0.3% |
| GLA NA | 2,584 | 1.5% | 4,891 | 2.9% | 936 | 8.1% |
| Total | 170,637 | 100.0% | 170,637 | 100.0% | 11,506 | 100.0% |

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[6] GLA NA refers to missing data, a "not applicable" situation, or "not available."

### Severe Disabilities

There were 5,303 students coded as severely disabled who had GLA reported for English Language Arts and Mathematics. There were 69 students coded as severely disabled who had GLA reported for French Language Arts. The chart below presents students having a severe disability code and their grade level of achievement.

Table 6 - Severe Disabilities, Provincial

**Students coded as having Severe Disabilities – Provincial**

| | Mathematics | | English Language Arts | | French Language Arts | |
|---|---|---|---|---|---|---|
| | Number of students | Percent of total enrolled (%) | Number of students | Percent of total enrolled (%) | Number of students | Percent of total enrolled (%) |
| GLA below enrolled grade | 2,022 | 38.1% | 2,101 | 39.6% | 14 | 20.3% |
| GLA equal to enrolled grade | 2,924 | 55.1% | 2,838 | 53.5% | 45 | 65.2% |
| GLA above enrolled grade | 11 | 0.2% | 9 | 0.2% | 0 | 0.0% |
| GLA NA | 346 | 6.5% | 355 | 6.7% | 10 | 14.5% |
| Total | 5,303 | 100.0% | 5,303 | 100.0% | 69 | 100.0% |

More than half of students with a severe disability enrolled in Mathematics have a GLA equal to their enrolled grade (55.1%). In Language Arts 53.5% of students have a GLA equal to their enrolled grade. Mathematics and Language Arts are fairly similar in their GLA distribution. A very low proportion of French Immersion or French as the language of instruction students were coded as severely disabled.

The chart below provides information on all students who were on a graded curriculum and were coded as severely disabled, by their disability type. The majority of students coded with a severe disability are those with an emotional/behavioural or physical/medical disability. Among the different types of severe disabilities, the distribution of students among GLA categories varies more widely than the overall severe disability distribution (see above table). Knowing the type of severe disability may aid in understanding the student distribution throughout GLA categories.

Table 7 - Type of Severe Disability

| Type of Severe Disability | | | Mathematics | | | English Language Arts | | |
|---|---|---|---|---|---|---|---|---|
| | Frequency | Percentage of Total | % at or above grade level | % below grade level | % GLA NA | % at or above grade level | % below grade level | % GLA NA |
| Severe Cognitive Disability | 12 | 0.2% | 33.3% | 41.7% | 25.0% | 41.7% | 33.3% | 25.0% |
| Severe Emotional /Behavioural Disability | 2,925 | 55.2% | 58.9% | 35.9% | 5.2% | 56.8% | 37.9% | 5.3% |
| Severe Multiple Disability | 204 | 3.8% | 28.9% | 56.4% | 14.7% | 27.0% | 56.9% | 16.2% |
| Severe Physical or Medical Disability | 1,976 | 37.3% | 52.3% | 39.6% | 7.6% | 52.4% | 39.9% | 7.7% |
| Deafness | 117 | 2.2% | 46.2% | 46.2% | 7.7% | 35.9% | 54.7% | 9.4% |
| Blindness | 68 | 1.3% | 77.9% | 20.6% | 1.5% | 72.1% | 25.0% | 2.9% |
| Total | 5,302 | 100.0% | 55.4% | 38.1% | 6.5% | 53.7% | 39.6% | 6.7% |

Note: 1 ECS student was not shown on this table. The student is included in the remainder of the report as they are enrolled in a grade.

Table 8 - Type of Severe Disability by Gender

| Type of Severe Disability by Gender | Gender | Frequency | Percentage of each disability code | Mathematics | | | English Language Arts | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | % at or above grade level | % below grade level | % GLA NA | % at or above grade level | % below grade level | % GLA NA |
| Severe Cognitive Disability | Male | 6 | 50.0% | 33.3% | 50.0% | 16.7% | 33.3% | 50.0% | 16.7% |
| | Female | 6 | 50.0% | 33.3% | 33.3% | 33.3% | 50.0% | 16.7% | 33.3% |
| Severe Emotional /Behavioural Disability | Male | 2,402 | 82.1% | 60.0%* | 35.1%* | 4.9% | 56.7%* | 37.9%* | 5.1% |
| | Female | 523 | 17.9% | 53.9% | 39.6% | 6.5% | 55.6% | 38.0% | 5.9% |
| Severe Multiple Disability | Male | 129 | 63.2% | 33.3% | 51.9% | 14.7% | 27.1% | 55.8% | 17.1% |
| | Female | 75 | 36.8% | 21.3% | 64.0%* | 14.7% | 26.7%* | 58.7%* | 14.7% |
| Severe Physical or Medical Disability | Male | 1,463 | 74.0% | 55.9% | 36.4% | 7.7% | 54.1% | 38.2% | 7.7% |
| | Female | 513 | 26.0% | 43.9%* | 48.5%* | 7.6% | 47.4%* | 44.8%* | 7.8% |
| Deafness | Male | 61 | 52.1% | 45.9% | 47.5% | 6.6% | 34.4% | 59.0% | 6.6% |
| | Female | 56 | 47.9% | 46.4%* | 44.6%* | 8.9%* | 37.5%* | 50.0%* | 12.5%* |
| Blindness | Male | 45 | 66.2% | 82.2% | 15.6% | 2.2% | 77.8% | 17.8% | 4.4% |
| | Female | 23 | 33.8% | 69.6%* | 30.4%* | 0.0% | 60.9% | 39.1%* | 0.0% |
| **Totals** | **Male** | **4,106** | **77.4%** | **57.7%** | **36.1%** | **6.2%** | **54.7%** | **38.7%** | **6.4%** |
| | **Female** | **1,196** | **22.6%** | **47.4%** | **45.0%** | **7.6%** | **49.5%** | **42.7%** | **7.6%** |

Note: 1 ECS student was not shown on this table. The student is included in the remainder of the report as they are enrolled in a grade.
\* Asterisk indicates a statistically significant difference between genders for the GLA categories indicated. Differences are significant at the 0.05 level.

When the students coded as having a severe disability are shown by gender, the large difference between genders becomes apparent. A large proportion (77.4%) of these students were males, most of whom were students with an emotional/behavioural disability.

### Mild/Moderate Disabilities

There were 16,769 students in the 2006-07 sample having mild or moderate disability codes in English Language Arts and Mathematics. In French Language Arts, 369 students were coded as having a mild or moderate disability. The chart below shows the mild or moderate students' distribution across GLA categories.

Table 9 - Mild/Moderate Disabilities

| Students coded as having Mild/Moderate Disabilities – Provincial | Mathematics | | English Language Arts | | French Language Arts | |
|---|---|---|---|---|---|---|
| | Number of students | Percent of total enrolled (%) | Number of students | Percent of total enrolled (%) | Number of students | Percent of total enrolled (%) |
| GLA below enrolled grade | 6,693 | 39.9% | 7,430 | 44.3% | 93 | 25.2% |
| GLA equal to enrolled grade | 9,415 | 56.1% | 8,692 | 51.8% | 222 | 60.2% |
| GLA above enrolled grade | 25 | 0.1% | 17 | 0.1% | 2 | 0.5% |
| GLA NA | 636 | 3.8% | 630 | 3.8% | 52 | 14.1% |
| **Total** | **16,769** | **100.0%** | **16,769** | **100.0%** | **369** | **100.0%** |

In both Mathematics and Language Arts, a slim majority of students have a GLA equal to their enrolled grade.

The chart below shows the breakdown of students on a graded curriculum having a mild or moderate disability by the type of disability. The largest proportion of students coded with a mild/moderate disability has a mild cognitive disability or a learning disability. Students having a mild or moderate cognitive disability compose the largest proportion of students attaining below their grade level. As in the severe disability chart, students who were 'at or above grade level' were combined into a single category due to the small number of students who were achieving 'above grade level'.

Table 10 - Type of Mild/Moderate Disability

| Type of Mild/Moderate Disability | | | Mathematics | | | English Language Arts | | |
|---|---|---|---|---|---|---|---|---|
| | Frequency | Percentage of Total | % at or above grade level | % below grade level | % GLA NA | % at or above grade level | % below grade level | % GLA NA |
| Mild Cognitive Disability | 2,922 | 17.4% | 21.6% | 68.7% | 9.7% | 21.0% | 69.7% | 9.2% |
| Moderate Cognitive Disability | 93 | 0.6% | 11.8% | 64.5% | 23.7% | 9.7% | 67.7% | 22.6% |
| Emotional/Behavioural Disability | 1,766 | 10.5% | 69.6% | 27.9% | 2.4% | 72.1% | 25.8% | 2.2% |
| Learning Disability | 7,726 | 46.1% | 60.3% | 37.4% | 2.3% | 55.1% | 43.0% | 1.9% |
| Hearing Disability | 173 | 1.0% | 76.3% | 20.2% | 3.5% | 76.3% | 20.8% | 2.9% |
| Visual Disability | 25 | 0.1% | 96.0% | 4.0% | 0.0% | 92.0% | 8.0% | 0.0% |
| Communication Disability | 2,330 | 13.9% | 72.2% | 25.3% | 2.5% | 59.8% | 36.1% | 4.1% |
| Physical/Medical Disability | 870 | 5.2% | 70.2% | 26.8% | 3.0% | 67.7% | 28.6% | 3.7% |
| Multiple Disability | 862 | 5.1% | 53.4% | 44.4% | 2.2% | 48.6% | 48.8% | 2.6% |
| **Total** | **16,767** | **100.0%** | **56.3%** | **39.9%** | **3.8%** | **51.9%** | **44.3%** | **3.8%** |

Note: 2 students coded as ECS Developmentally Immature were removed from this analysis. They have been included in the rest of the report.


The following chart shows each mild/moderate disability type by gender.

Table 11 - Type of Mild/Moderate Disability by Gender

| Type of Mild/Moderate Disability by Gender | Gender | Frequency | Percentage of each disability | Mathematics | | | English Language Arts | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | % at or above grade level | % below grade level | % GLA NA | % at or above grade level | % below grade level | % GLA NA |
| Mild Cognitive Disability | Male | 1,728 | 59.1% | 22.3% | 68.1% | 9.6% | 20.3% | 70.3% | 9.4% |
| | Female | 1,194 | 40.9% | 20.7%* | 69.4% | 9.9%* | 22.2%* | 68.9%* | 8.9% |
| Moderate Cognitive Disability | Male | 48 | 51.6% | 12.5% | 60.4% | 27.1% | 8.3% | 68.8% | 22.9% |
| | Female | 45 | 48.4% | 11.1% | 68.9% | 20.0% | 11.1% | 66.7% | 22.2% |
| Emotional/Behavioural Disability | Male | 1,295 | 73.3% | 70.1%* | 27.6%* | 2.3% | 71.9%* | 25.8%* | 2.3% |
| | Female | 471 | 26.7% | 68.4% | 28.9% | 2.8% | 72.6% | 25.7% | 1.7% |
| Learning Disability | Male | 4,820 | 62.4% | 62.4% | 35.2% | 2.4% | 54.3% | 43.7% | 2.0% |
| | Female | 2,906 | 37.6% | 56.7%* | 41.1% | 2.2% | 56.3%* | 41.9% | 1.8% |
| Hearing Disability | Male | 90 | 52.0% | 81.1% | 15.6% | 3.3% | 80.0% | 17.8% | 2.2% |
| | Female | 83 | 48.0% | 71.1%* | 25.3%* | 3.6% | 72.3%* | 24.1%* | 3.6% |
| Communication Disability | Male | 1,501 | 64.4% | 74.5% | 22.9% | 2.7% | 58.8% | 37.1% | 4.1% |
| | Female | 829 | 35.6% | 68.0% | 29.7% | 2.3% | 61.6% | 34.4% | 4.0% |
| Physical/Medical Disability | Male | 660 | 71.0% | 75.5%* | 21.2% | 3.3% | 68.8%*. | 27.2% | 4.0% |
| | Female | 270 | 29.0% | 58.5% | 39.3% | 2.2% | 65.2% | 31.9% | 3.0% |
| Multiple Disability | Male | 609 | 70.6% | 55.8%* | 41.9%* | 2.3% | 48.6%* | 48.8%* | 2.6% |
| | Female | 253 | 29.4% | 47.4% | 50.6% | 2.0% | 48.6% | 49.0% | 2.4% |
| Visual Disability | Male | 18 | 72.0% | 94.4% | 5.6% | 0.0% | 88.9% | 11.1% | 0.0% |
| | Female | 7 | 28.0% | 100.0% | 0.0% | 0.0% | 100.0% | 0.0% | 0.0% |
| Totals | Male | 10,709 | 63.9% | 58.9% | 37.4% | 3.7% | 52.1% | 44.1% | 3.7% |
| | Female | 6,058 | 36.1% | 51.7% | 44.4% | 3.9% | 51.6% | 44.7% | 3.7% |

Note: 2 students coded as ECS Developmentally Immature were removed from this analysis. They have been included in the rest of the report.
* Asterisk indicates a statistically significant difference between genders. Differences are significant at the 0.05 level.

Table 11 illustrates the gender differences in GLA categories across the mild/moderate disability types. The gender difference is most noticeable for students having a physical or medical disability.

## Gifted

In this sample of students, 3,314 were coded as being gifted in English Language Arts or Mathematics. There were 156 students in French Language Arts coded as gifted. The chart below shows the grade level of achievement distributions for students coded as gifted.

Table 12 - Gifted Students, Provincial

| Students coded as gifted – Provincial | Mathematics | | English Language Arts | | French Language Arts | |
|---|---|---|---|---|---|---|
| | Number of students | Percent of total enrolled (%) | Number of students | Percent of total enrolled (%) | Number of students | Percent of total enrolled (%) |
| GLA below enrolled grade | 74 | 2.2% | 79 | 2.4% | 3 | 1.9% |
| GLA equal to enrolled grade | 2,962 | 89.4% | 3,198 | 96.5% | 126 | 80.8% |
| GLA above enrolled grade | 248 | 7.5% | 12 | 0.4% | 1 | 0.6% |
| GLA NA | 30 | 0.9% | 25 | 0.8% | 26 | 16.7% |
| Total | 3,314 | 100.0% | 3,314 | 100.0% | 156 | 100.0% |

The general assumption with gifted students is that they tend to achieve and perform better than the population of students as a whole. According to the above frequency table, we can see that the majority of gifted students are performing equal to their enrolled grade level, and slightly more that 2% of students are 'below grade level' for each subject. Gifted students are performing better in Mathematics than in English Language Arts with approximately 7% more students having a GLA 'above grade level' in Math.

## English as a Second Language

For English as a Second Language (ESL) students, there were two groups of student codes. The first are ESL students coded as Canadian-born (303). Of this group of students there were 11,795 in English Language Arts and Mathematics and 353 students in French Language Arts. For ESL students who are coded as foreign-born (301), there were 11,139 in English Language Arts and Mathematics and 242 in French Language Arts. The distribution of both groups' GLAs is shown in the charts below.

Table 13 - Canadian-born ESL Students, Provincial

| Students coded as English as a Second Language – Canadians-born (303) - Provincial | Mathematics | | English Language Arts | | French Language Arts | |
|---|---|---|---|---|---|---|
| | Number of students | Percent of total enrolled (%) | Number of students | Percent of total enrolled (%) | Number of students | Percent of total enrolled (%) |
| GLA below enrolled grade | 1,480 | 12.5% | 1,898 | 16.1% | 28 | 7.9% |
| GLA equal to enrolled grade | 9,801 | 83.1% | 9,121 | 77.3% | 251 | 71.1% |
| GLA above enrolled grade | 69 | 0.6% | 40 | 0.3% | 4 | 1.1% |
| GLA NA | 445 | 3.8% | 736 | 6.2% | 70 | 19.8% |
| Total | 11,795 | 100.0% | 11,795 | 100.0% | 353 | 100.0% |

Table 14 - Foreign-born ESL Students, Provincial

**Students coded as English as a Second Language - Foreign-born (301) - Provincial**

| | Mathematics | | English Language Arts | | French Language Arts | |
|---|---|---|---|---|---|---|
| | Number of students | Percent of total enrolled (%) | Number of students | Percent of total enrolled (%) | Number of students | Percent of total enrolled (%) |
| GLA below enrolled grade | 1,260 | 11.3% | 2,061 | 18.5% | 17 | 7.0% |
| GLA equal to enrolled grade | 9,226 | 82.8% | 8,046 | 72.2% | 175 | 72.3% |
| GLA above enrolled grade | 68 | 0.6% | 14 | 0.1% | 2 | 0.8% |
| GLA NA | 585 | 5.3% | 1,018 | 9.1% | 48 | 19.8% |
| Total | 11,139 | 100.0% | 11,139 | 100.0% | 242 | 100.0% |

The above tables show that both Canadian-born and Foreign-born ESL students follow a similar pattern to one another. Approximately 83-84% of each ESL group is attaining a GLA that is equal to or above enrolled grade in Math and about 72-78% are equal to or above grade level in ELA.

## Gender

Students' GLA was broken down by gender in order to observe any patterns that may emerge. In this sample of students there was a larger number of males than females. The charts below show students' GLA by gender in each of the three subjects.

Table 15 - Gender, Mathematics, Provincial

| Gender - Provincial | Mathematics | | | |
|---|---|---|---|---|
| | Female | | Male | |
| | Number of students | Percent of total enrolled (%) | Number of students | Percent of total enrolled (%) |
| GLA below enrolled grade | 9,504 | 9.0% | 11,844 | 10.6% |
| GLA equal to enrolled grade | 93,918 | 88.7% | 96,508 | 86.7% |
| GLA above enrolled grade | 464 | 0.4% | 563 | 0.5% |
| GLA NA | 2,044 | 1.9% | 2,457 | 2.2% |
| Total | 105,930 | 100.0% | 111,372 | 100.0% |

Note: All of the above observed relationships were significant when measured by Chi square.

Table 16 - Gender, English Language Arts, Provincial

| Gender - Provincial | English Language Arts | | | |
|---|---|---|---|---|
| | Female | | Male | |
| | Number of students | Percent of total enrolled (%) | Number of students | Percent of total enrolled (%) |
| GLA below enrolled grade | 9,335 | 8.8% | 14,781 | 13.3% |
| GLA equal to enrolled grade | 92,749 | 87.6% | 92,399 | 83.0% |
| GLA above enrolled grade | 308 | 0.3% | 232 | 0.2% |
| GLA NA | 3,538 | 3.3% | 3,960 | 3.6% |
| Total | 105,930 | 100.0% | 111,372 | 100.0% |

Note: All of the above observed relationships were significant when measured by Chi square.

Table 17 - Gender, French Language Arts, Provincial

| Gender - Provincial | French Language Arts | | | |
| --- | --- | --- | --- | --- |
| | Female | | Male | |
| | Number of students | Percent of total enrolled (%) | Number of students | Percent of total enrolled (%) |
| GLA below enrolled grade | 360 | 5.1% | 381 | 6.7% |
| GLA equal to enrolled grade | 5980 | 85.2% | 4778 | 84.4% |
| GLA above enrolled grade | 31 | 0.4% | 14 | 0.3% |
| GLA NA | 651 | 9.3% | 491 | 8.7% |
| Total | 7022 | 100.0% | 5664 | 100.0% |

Note: All of the above observed relationships were significant when measured by Chi square.

The three tables above show the frequency of female and male students in each of the GLA categories in Mathematics, English Language Arts, and French Language Arts. When testing for independence between genders, Chi-squared[7] was used. There is a statistically significant difference between the genders in both Math and English Language Arts.

Pope, Wentzel and Cammaert (2003) conducted a study which showed that larger gender differences were found in school-awarded marks than in the diploma exam marks in favour of females in almost all diploma courses. Math courses (both Math 30 Pure and Applied) were among those subjects where boys, while being outperformed by girls in school-awarded marks, did better than girls in diploma exam marks. Therefore, the question of gender differences between GLA and PAT results were of interest in the current report.

The following tables illustrate the differences in GLA and PATs across the enrolled grades for each gender. It is quite interesting to note that, similar to the 2003 study, on GLAs, females outperform males to a statistically significant degree in both subjects in nearly all enrolled grades. The reverse is seen on the Math PAT results with males outperforming females to a statistically significant degree. However, in English Language Arts, females are outperforming males on the PATs. These findings point to a potential area for future research to investigate gender differentials and the causal factors associated with these differences.

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[7] Chi square is defined as "A nonparametric procedure for testing whether the observed frequencies of scores in different categories of a variable differ from the theoretically predicted frequencies" (Harris, 1995).

Table 18 - English Language Arts T-Tests

**English Language Arts GLA T-Tests**

| Enrolled Grade | Gender | 05-06 N | 05-06 Mean GLA | 06-07 N | 06-07 Mean GLA |
|---|---|---|---|---|---|
| 1 | F | 3,562 | 1.01 | 11,525 | 0.93* |
|   | M | 3,518 | 1.01 | 12,167 | 0.88* |
| 2 | F | 4,161 | 1.93* | 11,704 | 1.90* |
|   | M | 4,356 | 1.89* | 12,225 | 1.85* |
| 3 | F | 4,236 | 2.89* | 11,641 | 2.88* |
|   | M | 4,511 | 2.84* | 12,255 | 2.83* |
| 4 | F | 4,281 | 3.86* | 11,608 | 3.87* |
|   | M | 4,633 | 3.79* | 12,346 | 3.79* |
| 5 | F | 4,535 | 4.81* | 11,440 | 4.84* |
|   | M | 4,664 | 4.75* | 12,399 | 4.76* |
| 6 | F | 4,280 | 5.80* | 12,114 | 5.82* |
|   | M | 4,689 | 5.71* | 12,468 | 5.74* |
| 7 | F | 4,127 | 6.87* | 11,790 | 6.88* |
|   | M | 4,350 | 6.75* | 12,450 | 6.78* |
| 8 | F | 4,444 | 7.88* | 11,849 | 7.88* |
|   | M | 4,489 | 7.77* | 12,418 | 7.77* |
| 9 | F | 4,466 | 8.87* | 12,259 | 8.87* |
|   | M | 4,571 | 8.77* | 12,644 | 8.76* |

**English Language Arts PAT T-Tests**

| Enrolled Grade | Gender | 05-06 N | 05-06 Mean PAT Score | 06-07 N | 06-07 Mean PAT Score |
|---|---|---|---|---|---|
| 3 | F | 4,088 | 71.03* | 10,790 | 69.72* |
|   | M | 4,244 | 68.50* | 11,537 | 66.72* |
| 6 | F | 4,039 | 68.36* | 11,451 | 69.79* |
|   | M | 4,304 | 64.90* | 11,923 | 65.40* |
| 9 | F | 4,154 | 71.42* | 11,337 | 68.36* |
|   | M | 4,139 | 66.77* | 11,742 | 63.25* |

* indicates a statistically significant difference between males and females.

Table 19 - Math T-Tests

**Mathematics GLA T-Tests**

| Enrolled Grade | Gender | 05-06 N | 05-06 Mean GLA | 06-07 N | 06-07 Mean GLA |
|---|---|---|---|---|---|
| 1 | F | 4,024 | 1.01 | 11,525 | 0.95* |
|   | M | 4,080 | 1.01 | 12,167 | 0.93* |
| 2 | F | 4,293 | 1.95 | 11,704 | 1.93 |
|   | M | 4,495 | 1.96 | 12,225 | 1.92 |
| 3 | F | 4,250 | 2.92 | 11,641 | 2.90 |
|   | M | 4,530 | 2.91 | 12,255 | 2.89 |
| 4 | F | 4,274 | 3.88 | 11,608 | 3.89* |
|   | M | 4,640 | 3.87 | 12,346 | 3.86* |
| 5 | F | 4,521 | 4.84 | 11,440 | 4.85* |
|   | M | 4,660 | 4.83 | 12,399 | 4.82* |
| 6 | F | 4,266 | 5.83 | 12,114 | 5.82* |
|   | M | 4,670 | 5.80 | 12,468 | 5.80* |
| 7 | F | 3,941 | 6.88* | 11,790 | 6.87* |
|   | M | 4,212 | 6.83* | 12,450 | 6.82* |
| 8 | F | 4,197 | 7.89* | 11,849 | 7.86* |
|   | M | 4,254 | 7.80* | 12,418 | 7.81* |
| 9 | F | 4,217 | 8.85* | 12,259 | 8.82* |
|   | M | 4,346 | 8.78* | 12,644 | 8.76* |

**Mathematics PAT T-Tests**

| Enrolled Grade | Gender | 05-06 N | 05-06 Mean PAT Score | 06-07 N | 06-07 Mean PAT Score |
|---|---|---|---|---|---|
| 3 | F | 4,083 | 33.12* | 10,790 | 30.60* |
|   | M | 4,240 | 34.07* | 11,537 | 31.54* |
| 6 | F | 4,054 | 36.64* | 11,451 | 34.47* |
|   | M | 4,335 | 37.60* | 11,923 | 36.03* |
| 9 | F | 4,166 | 32.44 | 11,337 | 30.80* |
|   | M | 4,162 | 32.35 | 11,742 | 31.36* |

* indicates a statistically significant difference between males and females.

### Student Mobility

When a student changes schools, he/she must learn to deal with a new physical, social and learning environment - new teachers, new classmates, possibly different sets of rules, different learning expectations - and may start at a different point in the curriculum than he/she left behind. It also takes some time for teachers to determine the student's learning level, learning style, interaction skills, etc., and thus define the optimal program for his/her ongoing learning.

These issues contribute to the findings, within the research literature, of a negative relationship between the number of times a student changes schools in a given period and his/her academic growth in that period. Other studies (Wasserman, 2001) of this relationship in an Alberta setting have supported these findings and suggest that additional research would be useful, to not only enrich the understanding of the relationship but to highlight any situations in which the negative impacts may have been mitigated by helpful strategies to support better transitions for students and schools. The GLA data provides such an opportunity for additional research. It permits an on-going analysis of the relationship between the number of school changes students have made and their current grade level of achievement, thus allowing for an assessment of the cumulative impact of mobility.

Student mobility is captured by Alberta Education, once at the end of September and again in March, and compiled in the Student Information System (SIS). The Student Mobility Indicator (SMI) provides an indication of the number of times a student has changed schools since entry into the Alberta school system. The SMI is calculated by counting the number of different school registrations each student has up until the most recent calendar year. Students could be changing schools more frequently than is captured, thus the numbers shown are a conservative estimate of student mobility. All students start with an SMI of 1 as they have all been registered in at least one school. Student mobility is then broken down into two categories – high and low. In Grades 1-3, high mobility students are those having a mobility indicator of 2 or more. Students having a mobility indicator of 1 are considered low mobility. In Grades 4-6, high mobility students are those having a mobility indicator of 3 or more. Students having a mobility indicator of 2 or less are considered low mobility. In Grades 7-9, high mobility students are those having a mobility indicator of 4 or more. Low mobility students have a mobility indicator of 3 or less. In the following tables the two categories of mobility includes students on a graded curriculum in Grades 1 to 9.

Table 20 - Student Mobility, Mathematics, Provincial

| Mobility - Provincial | Mathematics | | | |
|---|---|---|---|---|
| | High | | Low | |
| | Number of students | Percent of total enrolled (%) | Number of students | Percent of total enrolled (%) |
| GLA below enrolled grade | 8,970 | 15.4% | 12,376 | 7.% |
| GLA equal to enrolled grade | 47,253 | 81.16% | 143,169 | 90.0% |
| GLA above enrolled grade | 317 | 0.5% | 710 | 0.5% |
| GLA NA | 1,680 | 2.9% | 2,819 | 1.8% |
| Total | 58,220 | 100.0% | 159,074 | 100.0% |

Table 21 - Student Mobility, English Language Arts, Provincial

| Mobility - Provincial | English Language Arts | | | |
|---|---|---|---|---|
| | High | | Low | |
| | Number of students | Percent of total enrolled (%) | Number of students | Percent of total enrolled (%) |
| GLA below enrolled grade | 9,515 | 16.3% | 14,599 | 9.2% |
| GLA equal to enrolled grade | 46,582 | 80.0% | 138,563 | 87.11% |
| GLA above enrolled grade | 122 | 0.2% | 418 | 0.3% |
| GLA NA | 2,001 | 3.4% | 5,494 | 3.5% |
| Total | 58,220 | 100.0% | 159,074 | 100.0% |

Table 22 - Student Mobility, French Language Arts, Provincial

| Mobility - Provincial | French Language Arts | | | |
|---|---|---|---|---|
| | High | | Low | |
| | Number of students | Percent of total enrolled (%) | Number of students | Percent of total enrolled (%) |
| GLA below enrolled grade | 113 | 6.5% | 628 | 5.7% |
| GLA equal to enrolled grade | 1,351 | 77.7% | 9,407 | 85.9% |
| GLA above enrolled grade | 6 | 0.3% | 39 | 0.4% |
| GLA NA | 268 | 15.4% | 874 | 8.0% |
| Total | 1,738 | 100.0% | 10,948 | 100.0% |

The majority of students can be described as having low mobility (69.1% of all students with GLA data). One of the most salient observations from the above tables is that a greater proportion of high mobility students have a GLA below their enrolled grade level compared to low mobility students. This observation supports the hypothesis that mobility negatively affects student achievement.

As noted above, student mobility was calculated based on the number of different school registrations a student had accumulated. Each student begins with an SMI of 1, indicating that they have been registered in one school. When a student registers in a different school, the SMI will increase by 1. The chart below lists the student mobility indicator values and the number of students having each SMI.

Table 23 - Student Mobility Indicator

| Student Mobility Indicator (SMI) | | | |
|---|---|---|---|
| Indicator | Frequency | Percent | Cumulative Percent |
| 1 | 95,890 | 44.1% | 44.1% |
| 2 | 60,141 | 27.7% | 71.8% |
| 3 | 29,879 | 13.8% | 85.5% |
| 4 | 14,714 | 6.8% | 92.3% |
| 5 | 7,651 | 3.5% | 95.8% |
| 6 | 4,080 | 1.9% | 97.7% |
| 7 | 2,176 | 1.0% | 98.7% |
| 8 | 1,200 | 0.6% | 99.3% |
| 9 | 735 | 0.3% | 99.6% |
| 10 | 363 | 0.2% | 99.8% |
| 11 | 213 | 0.1% | 99.9% |
| 12 | 123 | 0.1% | 99.88% |
| 13 | 64 | 0.06% | 99.94% |
| 14 | 28 | 0.03% | 99.97% |
| 15-21 | 30 | 0.03% | 100.0% |
| Total | 217,287* | 100.0% | 100.0% |

* 15 students are missing a student mobility indicator

The chart above shows approximately 86% of students in our sample had 3 or fewer different school registrations. Bear in mind students in the table above are in Grades 1 through 9 and those students in the younger grades are the reason for the large number of students with a mobility indicator of 3 or less. The following chart displays SMI by GLA above or equal to enrolled grade as well as by GLA below enrolled grade for English Language Arts.

Table 24 - Student Mobility Compared to GLA levels in English Language Arts

| Students' GLA levels compared to Mobility Indicators in English Language Arts | | | | |
|---|---|---|---|---|
| Mobility Indicator | GLA Equal or Above | GLA Below | GLA NA | Count |
| 1 | 81,988 (85.5%) | 9,255 (9.7%) | 4,647 (4.8%) | 95,890 |
| 2 | 53,287 (88.6%) | 5,768 (9.6%) | 1,086 (1.8%) | 60,141 |
| 3 | 25,749 (86.2%) | 3,505 (11.7%) | 625 (2.1%) | 29,879 |
| 4 | 12,134 (82.5%) | 2,202 (15.0%) | 378 (2.6%) | 14,714 |
| 5 | 6,083 (79.5%) | 1,346 (17.6%) | 222 (2.9%) | 7,651 |
| 6 | 3,091 (75.8%) | 827 (20.3%) | 162 (4.0%) | 4,080 |
| 7 | 1,561 (71.7%) | 479 (22.0%) | 136 (6.3%) | 2,176 |
| 8 | 812 (67.7%) | 310 (25.8%) | 78 (6.5%) | 1,200 |
| 9 | 471 (64.1%) | 199 (27.1%) | 65 (8.8%) | 735 |
| 10-21 | 505 (61.5%) | 222(27.0%) | 94(11.4%) | 821 |
| Total | 185,681 (85.5%) | 24,113 (11.1%) | 7,493 (3.4%) | 217,287* |

* 15 students are missing a student mobility indicator

The following two charts further examine the effect of student mobility on grade level of achievement in English Language Arts.

Table 25 - Student Mobility and English Language Arts by Enrolled Grade

| English Language Arts – Student Mobility | | | | | |
|---|---|---|---|---|---|
| Enrolled Grade | Mobility | GLA Equal or Above | GLA Below | GLA NA | Total |
| 1 | High | 3,382 (43.7%) | 685 (8.8%) | 296 (3.8%) | 4,363 (18.4%) |
| | Low | 15,661 (44.8%) | 1,633 (4.7%) | 2,030 (5.8%) | 19,324 (81.6%) |
| 2 | High | 6,104 (44.6%) | 1,120 (8.2%) | 358 (2.6%) | 7,582 (31.7%) |
| | Low | 13,645 (45.5%) | 1,437 (4.8%) | 1,264 (4.2%) | 16,346 (68.3%) |
| 3 | High | 7,411 (45.0%) | 1,420 (8.6%) | 227 (1.4%) | 9,058 (37.9%) |
| | Low | 13,111 (46.9%) | 1,402 (5.0%) | 323 (1.2%) | 14,836 (62.1%) |
| 4 | High | 3,589 (44.1%) | 895 (11.0%) | 70 (0.9%) | 4,554 (19.0%) |
| | Low | 17,025 (46.7%) | 2,059 (5.7%) | 316 (0.9%) | 19,400 (81.0%) |
| 5 | High | 4,446 (44.0%) | 1,105 (10.9%) | 100 (1.0%) | 5,651 (23.7%) |
| | Low | 15,841 (46.6%) | 2,033 (6.0%) | 314 (0.9%) | 18,188 (76.3%) |
| 6 | High | 5,834 (44.7%) | 1,292 (9.9%) | 92 (0.7%) | 7,218 (29.4%) |
| | Low | 15,342 (46.9%) | 1,774 (5.4%) | 248 (0.8%) | 17,364 (70.6%) |
| 7 | High | 4,702 (44.7%) | 965 (9.2%) | 159 (1.5%) | 5,826 (24.0%) |
| | Low | 16,728 (47.6%) | 1,375 (3.9%) | 311 (0.9%) | 18,414 (76.0%) |
| 8 | High | 5,130 (44.9%) | 941 (8.2%) | 225 (2.0%) | 6,296 (25.9%) |
| | Low | 16,222 (47.4%) | 1,434 (4.2%) | 315 (0.9%) | 17,971 (74.1%) |
| 9 | High | 6,107 (44.3%) | 1,092 (7.9%) | 473 (3.4%) | 7,672 (30.8%) |
| | Low | 15,405 (47.2%) | 1,452 (4.4%) | 374 (1.1%) | 17,231 (69.2%) |

The next graph shows the mean GLA values in English Language Arts for each grade broken down by the student mobility indicator.



Mean GLA per enrolled grade as SMI increases in English Language Arts
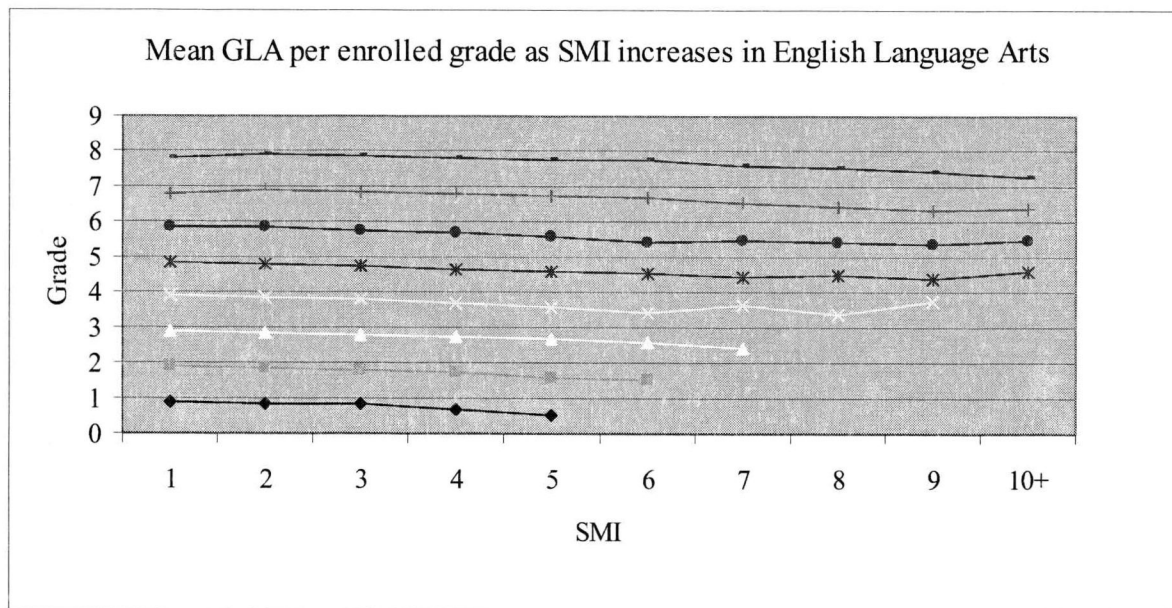
* Categories with fewer than 20 students have been removed

20

In Grades 1 through 6 the majority of students have an SMI of 1 indicating that these students have not changed schools. In Grades 7 to 9 the majority of students have an SMI of 2 illustrating the usual pattern of moving to a new school for junior high.

Table 26 - Student Mobility Compared to GLA levels in Mathematics

| Students' GLA levels compared to Mobility Indicators in Mathematics | | | | |
|---|---|---|---|---|
| Mobility Indicator | GLA Equal or Above | GLA Below | GLA NA | Count |
| 1 | 174,522 (95.4%) | 6,720 (3.7%) | 1,615 (0.9%) | 182,857 |
| 2 | 53,921 (89.7%) | 5,247 (8.7%) | 973 (1.6%) | 60,141 |
| 3 | 25,724 (86.1%) | 3,489 (11.7%) | 666 (2.2%) | 29,879 |
| 4 | 12,068 (82.0%) | 2,236 (15.2%) | 410 (2.8%) | 14,714 |
| 5 | 5,970 (78.0%) | 1,440 (18.8%) | 241 (3.1%) | 7,651 |
| 6 | 3,025 (74.1%) | 870 (21.3%) | 185 (4.5%) | 4,080 |
| 7 | 1,501 (69.0%) | 533 (24.5%) | 142 (6.5%) | 2,176 |
| 8 | 775 (64.6%) | 335 (27.9%) | 90 (7.5%) | 1,200 |
| 9 | 429 (58.4%) | 229 (31.2%) | 77 (10.5%) | 735 |
| 10-21 | 478 (58.2%) | 245 (29.8%) | 98 (11.9%) | 821 |
| Total | 191,446 (88.1%) | 21,344 (9.8%) | 4,497 (2.1%) | 217,287* |

* 15 students are missing a student mobility indicator

Table 27 - Student Mobility and Math by Enrolled Grade

| Math- Student Mobility | | | | | |
|---|---|---|---|---|---|
| Enrolled Grade | Mobility | GLA Equal or Above | GLA Below | GLA NA | Total |
| 1 | High | 3,779 (86.6%) | 475 (10.9%) | 109 (2.5%) | 4,363 (18.4%) |
|  | Low | 17,922 (92.7%) | 989 (5.1%) | 413 (2.1%) | 19,324 (81.6%) |
| 2 | High | 6,718 (88.6%) | 754 (9.9%) | 110 (1.5%) | 7,582 (31.7%) |
|  | Low | 15,168 (92.8%) | 947 (5.8%) | 231 (1.4%) | 16,346 (68.3%) |
| 3 | High | 7,739 (85.4%) | 1,128 (12.5%) | 191 (2.1%) | 9,058 (37.9%) |
|  | Low | 13,616 (91.8%) | 999 (6.7%) | 221 (1.5%) | 14,836 (62.1%) |
| 4 | High | 3,705 (81.4%) | 784 (17.2%) | 65 (1.4%) | 4,554 (19.0%) |
|  | Low | 17,631 (90.9%) | 1,536 (7.9%) | 233 (1.2%) | 19,400 (81.0%) |
| 5 | High | 4,527 (80.1%) | 1,021 (18.1%) | 103 (1.8%) | 5,651 (23.7%) |
|  | Low | 16,344 (89.9%) | 1,606 (8.8%) | 238 (1.3%) | 18,188 (76.3%) |
| 6 | High | 5,883 (81.5%) | 1,239 (17.2%) | 96 (1.3%) | 7,218 (29.4%) |
|  | Low | 15,657 (90.2%) | 1,520 (8.8%) | 187 (1.1%) | 17,364 (70.6%) |
| 7 | High | 4,620 (79.3%) | 1,027 (17.6%) | 179 (3.1%) | 5,826 (24.0%) |
|  | Low | 16,672 (90.5%) | 1,406 (7.6%) | 336 (1.8%) | 18,414 (76.0%) |
| 8 | High | 4,937 (78.4%) | 1,096 (17.4%) | 263 (4.2%) | 6,296 (25.9%) |
|  | Low | 16,009 (89.1%) | 1,574 (8.8%) | 388 (2.2%) | 17,971 (74.1%) |
| 9 | High | 5,663 (73.8%) | 1,446 (18.8%) | 563 (7.3%) | 7,672 (30.8%) |
|  | Low | 14,859 (86.2%) | 1,799 (10.4%) | 573 (3.3%) | 17,231 (69.2%) |

The mean GLA values for Math in each grade were plotted against SMI values to produce the following chart. Once again, aside from the first grade there is a gradual decrease in the mean GLA as the SMI increases.

**Mean GLA per enrolled grade as SMI increases in Mathematics**

*(Line chart: y-axis labeled "Grade" from 0 to 9; x-axis labeled "SMI" from 1 to 10+. Multiple series showing mean GLA values gradually decreasing as SMI increases.)*
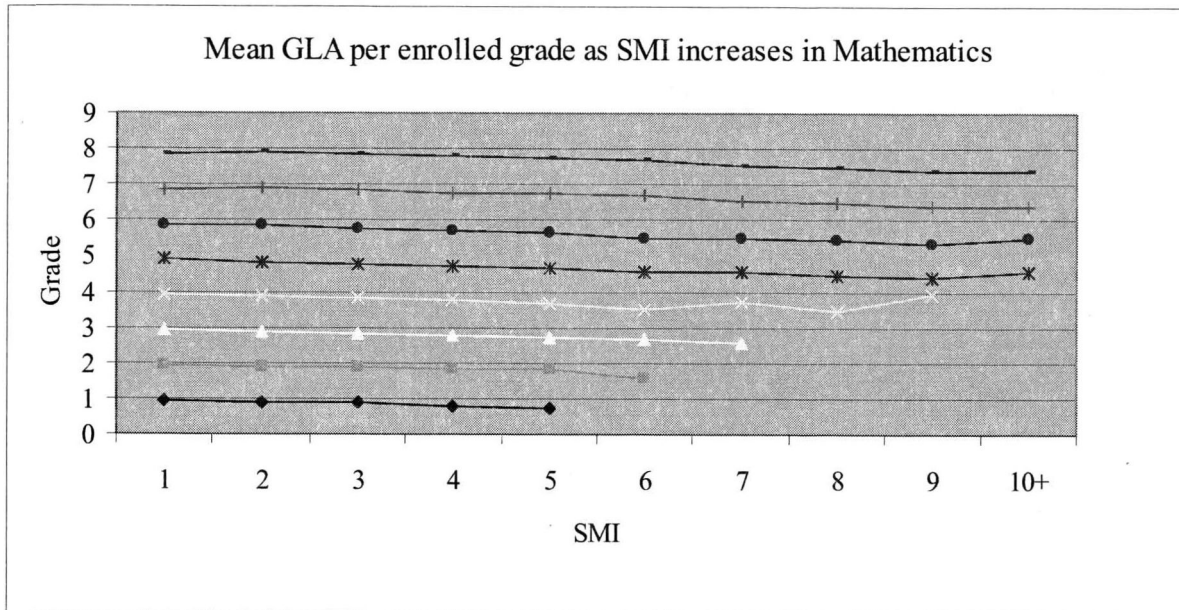
* Categories with less than 20 students have been removed

The following graph illustrates the effect mobility can have on achievement.

**Percent of Students Below Grade Level by Mobility Category for each Grade**

*(Line chart: y-axis labeled "Percent Below Grade Level" from 0.0% to 25.0%; x-axis labeled "Enrolled Grade" from 1 to 9. Two series: High Mobility and Low Mobility.)*

High Mobility — Low Mobility
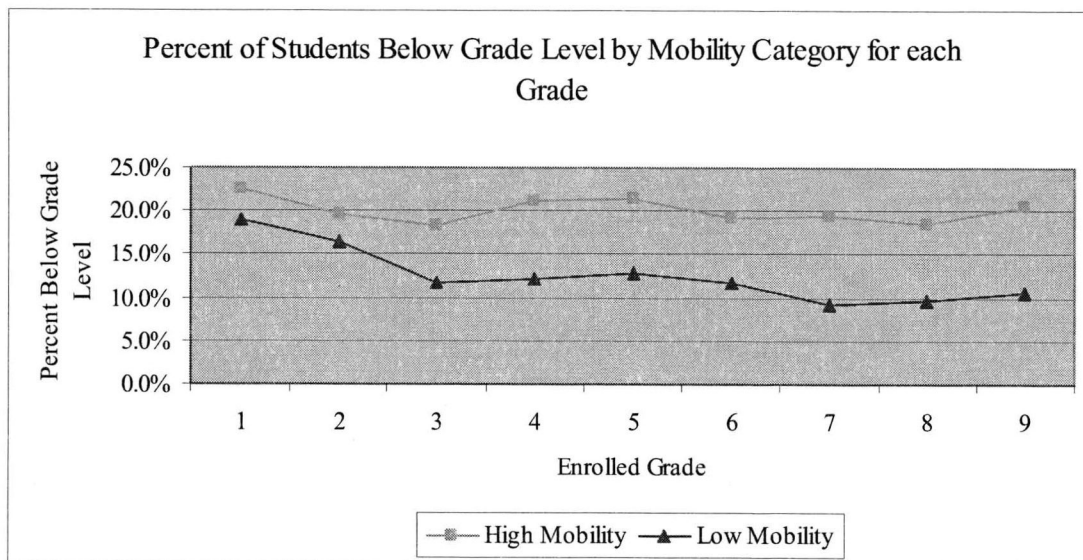
As the graph above illustrates, there is a noticeable effect between high and low mobility. There is a statistically significant difference between the mobility groups in Grades 4 through 9. This significance may indicate that mobility has a more pronounced effect as students age. It may also

be due to the likelihood of students having a higher mobility indicator as their enrolled grade increases.

## Correlations between SMI and GLA

Kendall's tau-b values were calculated in order to illustrate the relationship between SMI and GLA groupings. Kendall's tau-b is an alternative non-parametric form of rank correlations. The tau-b is used as an inferential statistic to show the strength of those relationships. Tau-b is used to measure the association between student mobility and GLA. This particular test was chosen as it uses ordinal level data based on pair by pair comparisons. The chart below details the correlations.

Table 28 - SMI by GLA, Tau-b Calculations

| SMI by GLA- Grade and Subject | 05-06 Tau-b | 06-07 Tau-b |
|---|---|---|
| Eng. LA and SMI | 0.096* | 0.103* |
| Math and SMI | 0.126* | 0.117* |

\* correlation is significant at the 0.01 level.

The above correlations between student mobility and GLA are significant at the 0.01 level in both years. They are relatively weak in strength, although this is to be expected as student mobility can affect a student's GLA but is only one of many determining variables. The correlations are similar between the two years of data indicating the validity of the data.

## Students not on a Graded Curriculum (Modified Programming)

There were 3,380 students not on a graded curriculum in this study. The students were assessed based on the degree of achievement in their Individual Program Plans (IPP's) relative to their foundational skills, academic readiness skills and life skills. The results reported below should be considered preliminary as data will become more meaningful as multi-year trends become available.

Table 29 - IPP Foundation Skills

| Foundation Skills | Number of Students | Percent of Total Enrolled (%) |
|---|---|---|
| All skills attained | 558 | 16.5% |
| Most skills attained | 1,078 | 31.9% |
| Some skills attained | 1,015 | 30.0% |
| None of the skills attained | 111 | 3.3% |
| N/A | 618 | 18.3% |
| Total | 3,380 | 100.0% |

Table 30 - IPP Academic Readiness Skills

| Academic Readiness Skills | Number of Students | Percent of Total Enrolled (%) |
|---|---|---|
| All skills attained | 486 | 14.4% |
| Most skills attained | 1,087 | 32.2% |
| Some skills attained | 1,266 | 37.5% |
| None of the skills attained | 156 | 4.6% |
| N/A | 385 | 11.4% |
| **Total** | **3,380** | **100.0%** |

Table 31 - IPP Life Skills

| Life Skills | Number of Students | Percent of Total Enrolled (%) |
|---|---|---|
| All skills attained | 397 | 11.7% |
| Most skills attained | 995 | 29.4% |
| Some skills attained | 878 | 25.9% |
| None of the skills attained | 80 | 2.4% |
| N/A | 1,030 | 30.5% |
| **Total** | **3,380** | **100.0%** |

## GLA and Enrolled Grade

The following tables and graphs show GLA values by enrolled grade for all students, in English Language Arts and Math. N1 indicates students that are not yet at the Grade 1 level.

## Grade Level of Achievement by Enrolled Grade

## Grade One

| Grade Level | ELA | % of Total | Math | % of Total |
|---|---|---|---|---|
| N1 | 2,320 | 9.8% | 1465 | 6.2% |
| 1 | 18,962 | 80.0% | 21649 | 91.4% |
| 2 | 77 | 0.3% | 50 | 0.2% |
| 3 | 3 | 0.0% | 3 | 0.0% |
| 4 | 1 | 0.0% | 1 | 0.0% |
| Missing | 2,329 | 9.8% | 524 | 2.2% |
| **Total** | **23,692** | **100.0%** | **23692** | **100.0%** |
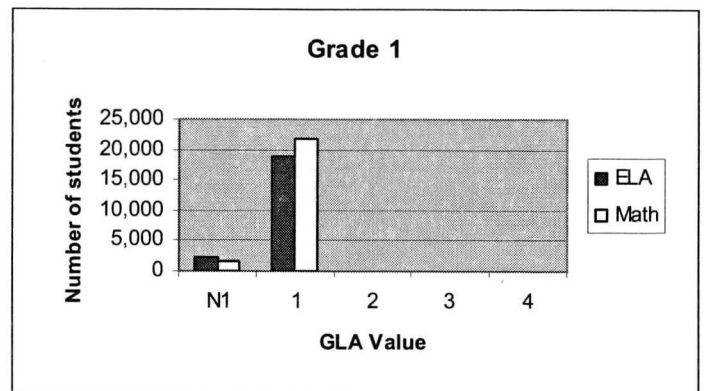
## Grade Two

| Grade Level | ELA | % of Total | Math | % of Total |
|---|---|---|---|---|
| N1 | 333 | 1.4% | 189 | 0.8% |
| 1 | 2,224 | 9.3% | 1,512 | 6.3% |
| 2 | 19,676 | 82.2% | 21,825 | 91.2% |
| 3 | 59 | 0.2% | 54 | 0.2% |
| 4 | 13 | 0.1% | 7 | 0.0% |
| 5 | 1 | 0.0% | 1 | 0.0% |
| Missing | 1,623 | 6.8% | 341 | 1.4% |
| **Total** | **23,929** | **100.0%** | **23,929** | **100.0%** |
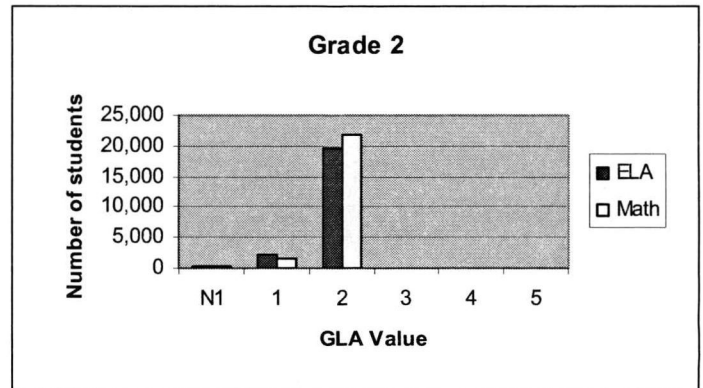


Grade 2

## Grade Three

| Grade Level | ELA | % of Total | Math | % of Total |
|---|---|---|---|---|
| N1 | 85 | 0.4% | 60 | 0.3% |
| 1 | 531 | 2.2% | 305 | 1.3% |
| 2 | 2,206 | 9.2% | 1,763 | 7.4% |
| 3 | 20,436 | 85.5% | 21,268 | 89.0% |
| 4 | 82 | 0.3% | 87 | 0.4% |
| 5 | 3 | 0.0% | 0 | 0.0% |
| 7 | 1 | 0.0% | 0 | 0.0% |
| Missing | 552 | 2.3% | 413 | 1.7% |
| **Total** | **23,896** | **100.0%** | **23,896** | **100.0%** |
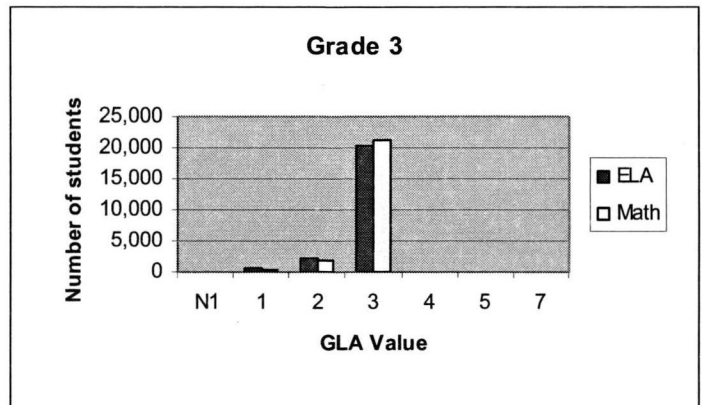


Grade 3

## Grade Four

| Grade Level | ELA | % of Total | Math | % of Total |
|---|---|---|---|---|
| N1 | 49 | 0.2% | 24 | 0.1% |
| 1 | 244 | 1.0% | 97 | 0.4% |
| 2 | 560 | 2.3% | 467 | 1.9% |
| 3 | 2,101 | 8.8% | 1,732 | 7.2% |
| 4 | 20,529 | 85.7% | 21,255 | 88.7% |
| 5 | 84 | 0.4% | 77 | 0.3% |
| 6 | 1 | 0.0% | 4 | 0.0% |
| Missing | 386 | 1.6% | 298 | 1.2% |
| **Total** | **23,954** | **100.0%** | **23,954** | **100.0%** |
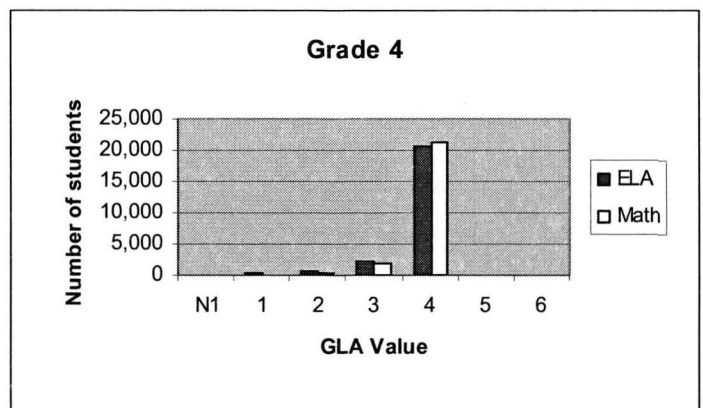


Grade 4

## Grade Five

| Grade Level | ELA | % of Total | Math | % of Total |
|---|---|---|---|---|
| N1 | 30 | 0.1% | 16 | 0.1% |
| 1 | 109 | 0.5% | 73 | 0.3% |
| 2 | 264 | 1.1% | 206 | 0.9% |
| 3 | 741 | 3.1% | 624 | 2.6% |
| 4 | 1,994 | 8.4% | 1,708 | 7.2% |
| 5 | 20,215 | 84.8% | 20,794 | 87.2% |
| 6 | 67 | 0.3% | 76 | 0.3% |
| 7 | 4 | 0.0% | 1 | 0.0% |
| 8 | 1 | 0.0% | 0 | 0.0% |
| Missing | 414 | 1.7% | 341 | 1.4% |
| **Total** | **23,839** | **100.0%** | **23,839** | **100.0%** |
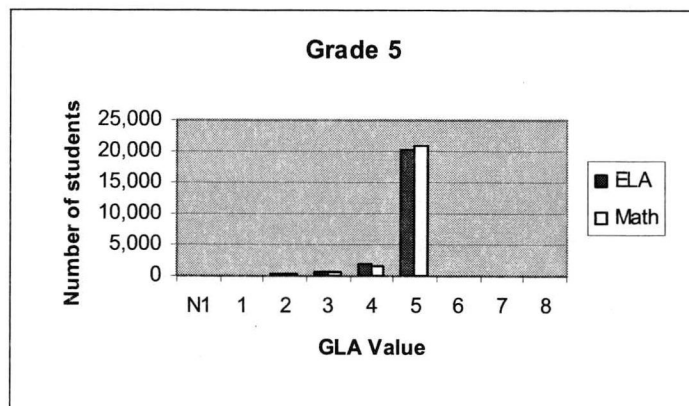


Grade 5

## Grade Six

| Grade Level | ELA | % of Total | Math | % of Total |
|---|---|---|---|---|
| N1 | 26 | 0.1% | 16 | 0.1% |
| 1 | 62 | 0.3% | 25 | 0.1% |
| 2 | 155 | 0.6% | 101 | 0.4% |
| 3 | 365 | 1.5% | 326 | 1.3% |
| 4 | 765 | 3.1% | 717 | 2.9% |
| 5 | 1,693 | 6.9% | 1,574 | 6.4% |
| 6 | 21,144 | 86.0% | 21,485 | 87.4% |
| 7 | 25 | 0.1% | 52 | 0.2% |
| 8 | 7 | 0.0% | 2 | 0.0% |
| 9 | 0 | 0.0% | 1 | 0.0% |
| Missing | 340 | 1.4% | 283 | 1.2% |
| **Total** | **24,582** | **100.0%** | **24,582** | **100.0%** |
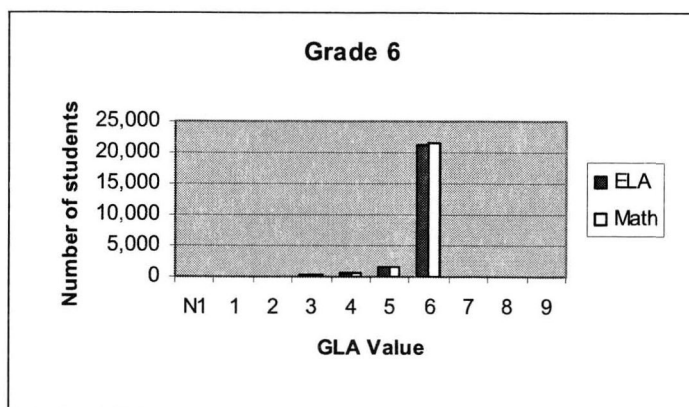


Grade 6

## Grade Seven

| Grade Level | ELA | % of Total | Math | % of Total |
|---|---|---|---|---|
| N1 | 7 | 0.0% | 7 | 0.0% |
| 1 | 26 | 0.1% | 10 | 0.0% |
| 2 | 57 | 0.2% | 33 | 0.1% |
| 3 | 147 | 0.6% | 122 | 0.5% |
| 4 | 247 | 1.0% | 243 | 1.0% |
| 5 | 491 | 2.0% | 427 | 1.8% |
| 6 | 1,365 | 5.6% | 1,591 | 6.6% |
| 7 | 21,369 | 88.2% | 21,078 | 87.0% |
| 8 | 54 | 0.2% | 177 | 0.7% |
| 9 | 6 | 0.0% | 37 | 0.2% |
| 10 | 1 | 0.0% | 0 | 0.0% |
| Missing | 470 | 1.9% | 515 | 2.1% |
| **Total** | **24,240** | **100.0%** | **24,240** | **100.0%** |
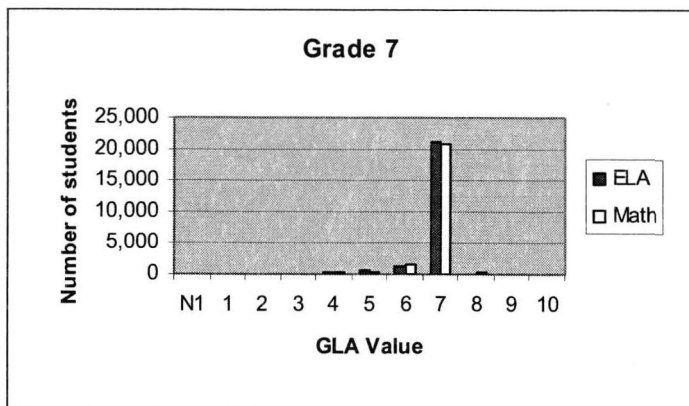


Grade 7

## Grade Eight

| Grade Level | ELA | % of Total | Math | % of Total |
|---|---|---|---|---|
| N1 | 3 | 0.0% | 5 | 0.0% |
| 1 | 9 | 0.0% | 2 | 0.0% |
| 2 | 33 | 0.1% | 22 | 0.1% |
| 3 | 71 | 0.3% | 61 | 0.3% |
| 4 | 145 | 0.6% | 102 | 0.4% |
| 5 | 216 | 0.9% | 204 | 0.8% |
| 6 | 460 | 1.9% | 438 | 1.8% |
| 7 | 1,438 | 5.9% | 1,836 | 7.6% |
| 8 | 21,317 | 87.8% | 20,706 | 85.3% |
| 9 | 30 | 0.1% | 230 | 0.9% |
| 10 | 3 | 0.0% | 8 | 0.0% |
| 11 | 1 | 0.0% | 2 | 0.0% |
| Missing | 541 | 2.2% | 651 | 2.7% |
| **Total** | **24,267** | **100.0%** | **24,267** | **100.0%** |
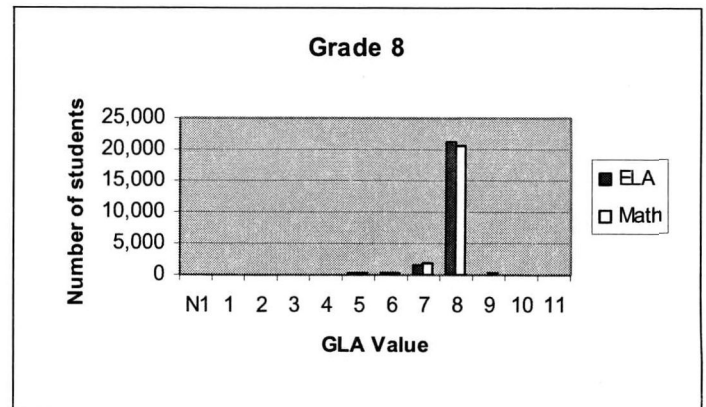


## Grade Nine

| Grade Level | ELA | % of Total | Math | % of Total |
|---|---|---|---|---|
| N1 | 7 | 0.0% | 8 | 0.0% |
| 1 | 10 | 0.0% | 4 | 0.0% |
| 2 | 8 | 0.0% | 14 | 0.1% |
| 3 | 42 | 0.2% | 32 | 0.1% |
| 4 | 73 | 0.3% | 77 | 0.3% |
| 5 | 127 | 0.5% | 99 | 0.4% |
| 6 | 210 | 0.8% | 208 | 0.8% |
| 7 | 400 | 1.6% | 498 | 2.0% |
| 8 | 1,667 | 6.7% | 2,305 | 9.3% |
| 9 | 21,500 | 86.3% | 20,366 | 81.8% |
| 10 | 11 | 0.0% | 151 | 0.6% |
| 11 | 0 | 0.0% | 5 | 0.0% |
| 12 | 1 | 0.0% | 0 | 0.0% |
| Missing | 847 | 3.4% | 1,136 | 4.6% |
| **Total** | **24,903** | **100.0%** | **24,903** | **100.0%** |
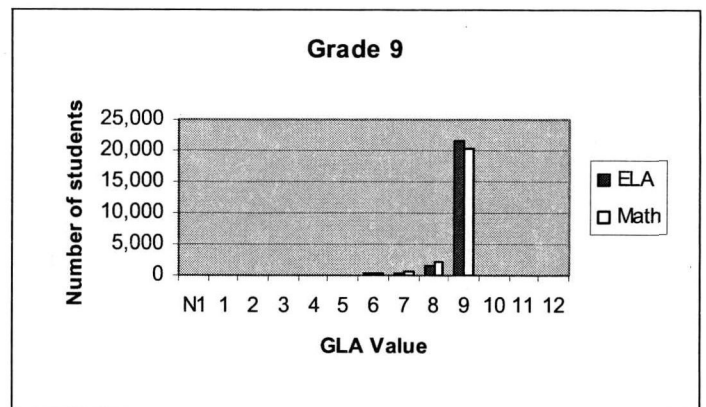


Using the student counts from the above tables, the number of students whose GLA is below grade level in each grade are shown in the graph below. From Grade 1 to 6 there are a higher number of students attaining below grade level in English Language Arts. In Grade 7 to 9 there are a higher number of students attaining below grade level in Mathematics.

**Number of Students Below Grade Level by Enrolled Grade**

| Grade Level | ELA | % of Total | Math | % of Total |
|---|---|---|---|---|
| 1 | 2,320 | 9.6% | 1,465 | 6.9% |
| 2 | 2,557 | 10.6% | 1,701 | 8.0% |
| 3 | 2,822 | 11.7% | 2,128 | 10.0% |
| 4 | 2,954 | 12.2% | 2,320 | 10.9% |
| 5 | 3,138 | 13.0% | 2,627 | 12.3% |
| 6 | 3,066 | 12.7% | 2,759 | 12.9% |
| 7 | 2,340 | 9.7% | 2,433 | 11.4% |
| 8 | 2,375 | 9.8% | 2,670 | 12.5% |
| 9 | 2,544 | 10.5% | 3,245 | 15.2% |
| Total | 24,116 | 100.0% | 21,348 | 100.0% |



Number of Students Below Grade Level by Enrolled Grade
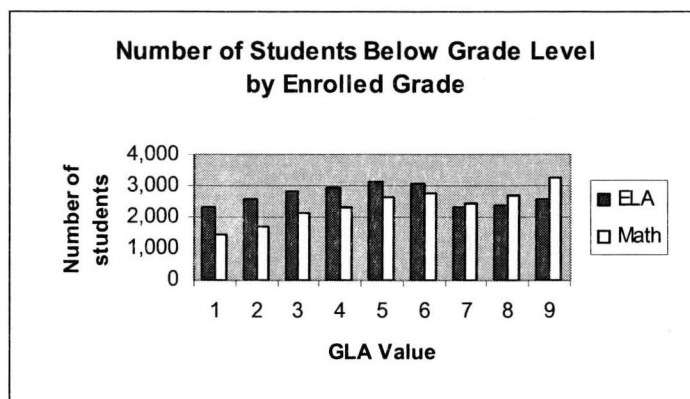
## Correlations between GLA and Enrolled Grade by Sub-Groups of the Population

Correlations between the students' GLAs and enrolled grades were calculated using Spearman's rho to determine the "goodness of fit" between GLA and enrolled grade related to students' being "coded" or not. The correlation between the two variables reflects the degree to which they "move" together. In this case, a high positive correlation coefficient results when an increase in enrolled grade is mirrored by the same increase in grade level of achievement. As was expected, GLA was highly correlated to enrolled grade, meaning the enrolled grade of a student typically matches their GLA. In English Language Arts this relationship was strongest for the gifted students, while students with severe disabilities had the lowest correlation between GLA and enrolled grade. In Math, the relationship was strongest for the non-coded students while students with severe disabilities had the lowest correlation. A comparison to the 2005-06 GLA correlations is shown in the tables below.

Table 32 - Correlations between GLA and Enrolled Grade, ELA

| | English GLA | |
|---|---|---|
| **Student Codes** | **2005-06 Correlation Coefficient** | **2006-07 Correlation Coefficient** |
| Non-Coded | .991** | .991** |
| Severe Disabilities | .853** | .868** |
| Mild/Moderate Disabilities | .845** | .896** |
| Gifted | .994** | .994** |
| ESL Canadian Born (303) | .974** | .966** |
| ESL Foreign Born (301) | .925** | .945** |

**Correlation is significant at the 0.01 level (2-tailed)

Table 33 - Correlations between GLA and Enrolled Grade, Math

| | Mathematics | |
| --- | --- | --- |
| Student Codes | 2005-06 Correlation Coefficient | 2006-07 Correlation Coefficient |
| Non-Coded | .994* | .992** |
| Severe Disabilities | .863** | .874** |
| Mild/Moderate Disabilities | .854** | .901** |
| Gifted | .980** | .984** |
| ESL Canadian Born (303) | .985** | .975** |
| ESL Foreign Born (301) | .974** | .971** |

** Correlation is significant at the 0.01 level (2-tailed).

The graphs (next pages) show GLA by enrolled grade for all students as well as sub-populations of students, in English Language Arts and Math. The mean GLA value is plotted against the enrolled grade to show graphically the degree to which students' GLA reflects or departs from their enrolled grade relative to sub-group affiliations. As anticipated, the first two graphs demonstrate the close relationship between enrolled grade and GLA for non-coded students. This pattern is parallel to the high percentage of students who attain the acceptable standard on provincial achievement tests.

**Non-Coded Students – English Language Arts**
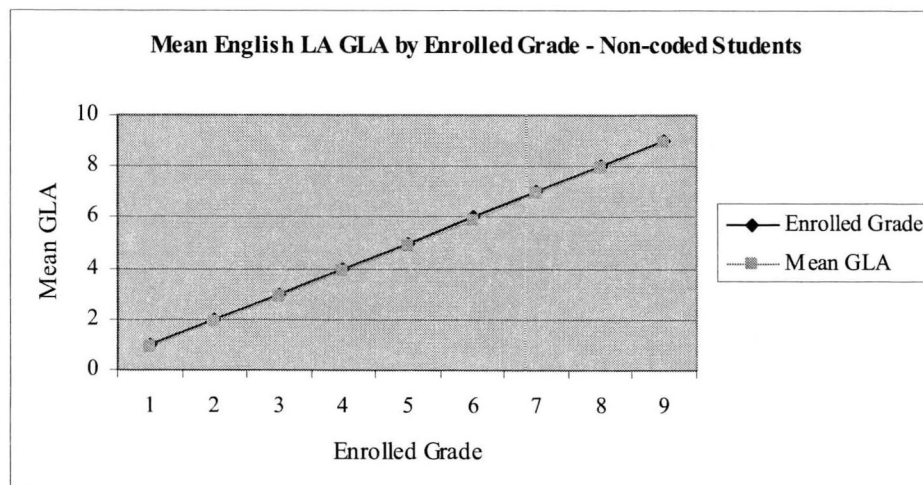
# Non-Coded Students – Mathematics
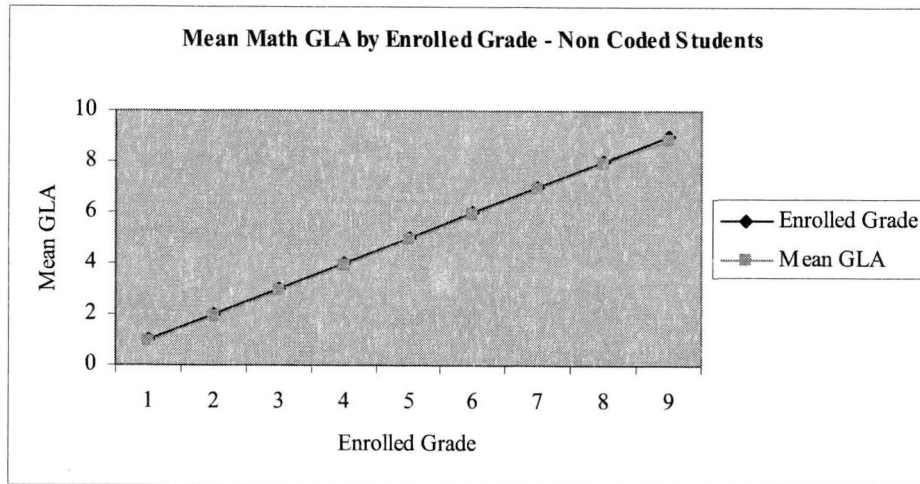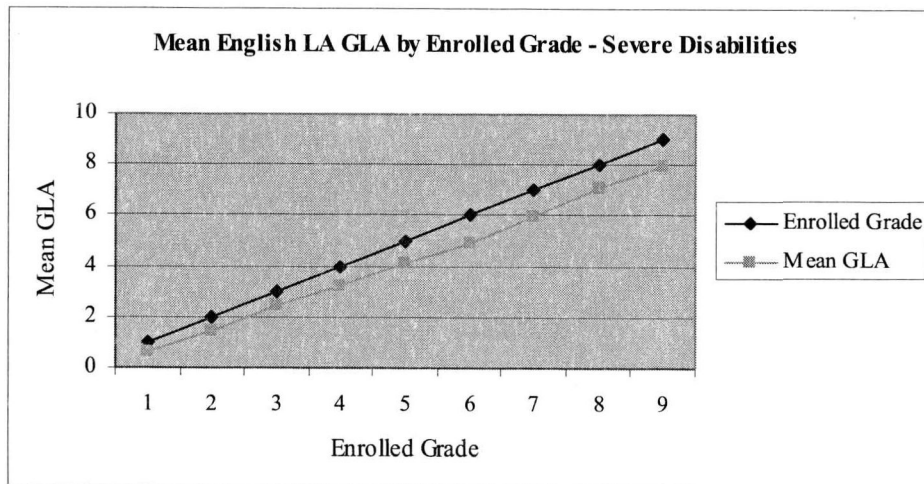
**Mean Math GLA by Enrolled Grade - Non Coded Students**



# Students with Severe Disabilities- English Language Arts
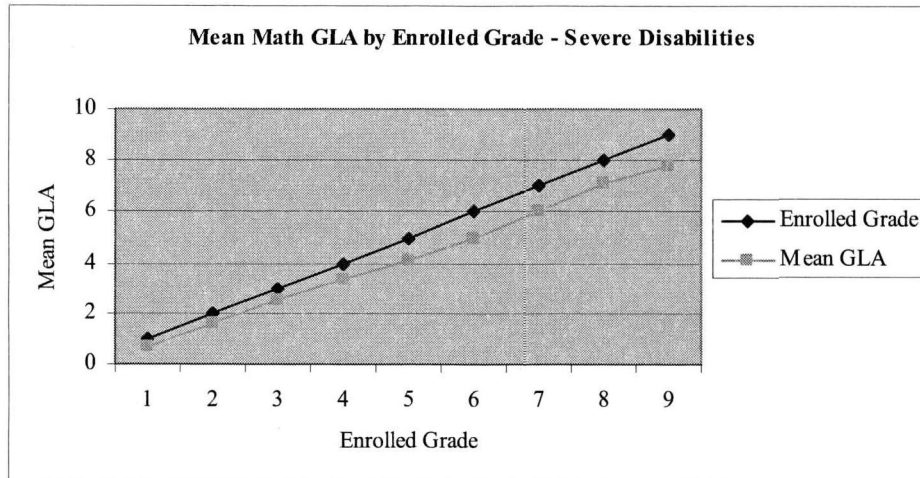
**Mean English LA GLA by Enrolled Grade - Severe Disabilities**

# Students with Severe Disabilities – Mathematics

**Mean Math GLA by Enrolled Grade - Severe Disabilities**



# Students with Mild/Moderate Disabilities – English Language Arts

**Mean English LA GLA by Enrolled Grade - Mild/Moderate Disabilities**

## Students with Mild/Moderate Disabilities – Mathematics

**Mean Math GLA by Enrolled Grade - Mild/Moderate Disabilities**



## Gifted Students – English Language Arts

**Mean English LA GLA by Enrolled Grade - Gifted**

## Gifted Students – Mathematics

**Mean Math GLA by Enrolled Grade - Gifted**



## ESL Canadian-Born Students – English Language Arts

**Mean English LA GLA by Enrolled Grade - ESL Canadian Born (303)**

## ESL Canadian-Born Students – Mathematics

**Mean Math GLA by Enrolled Grade - ESL Canadian Born (303)**



## ESL Foreign-Born Students – English Language Arts

**Mean English LA GLA by Enrolled Grade - ESL Foreign Born (301)**

## ESL Foreign-Born Students – Mathematics

**Mean Math GLA by Enrolled Grade - ESL Foreign Born (301)**
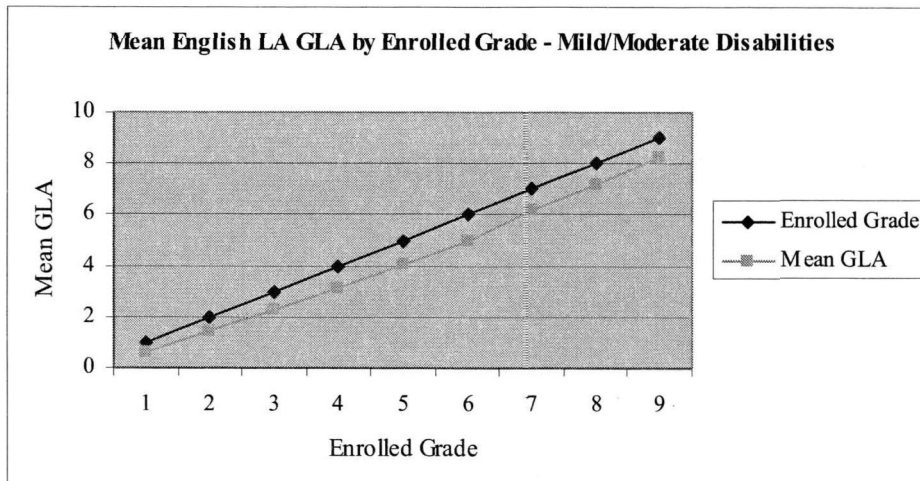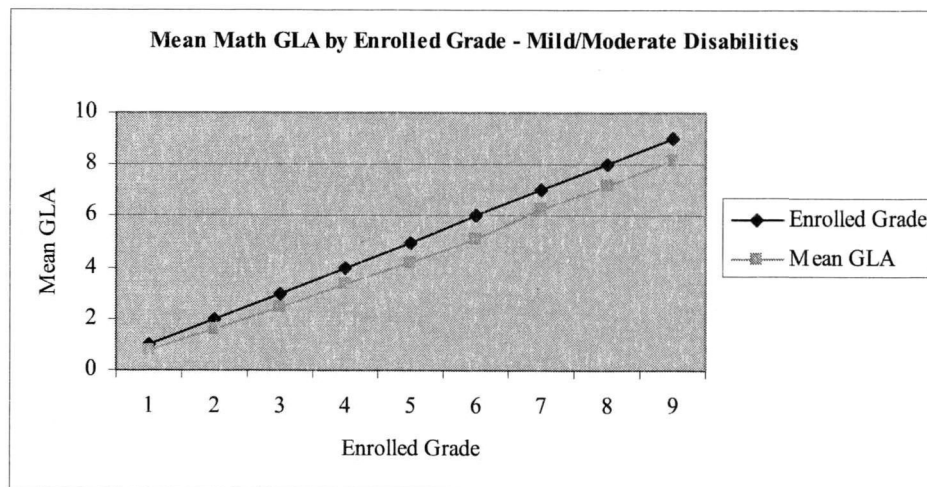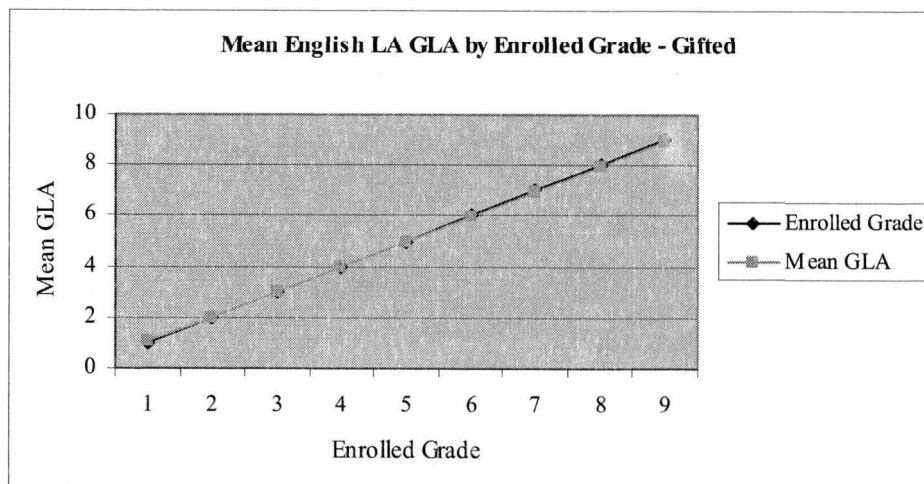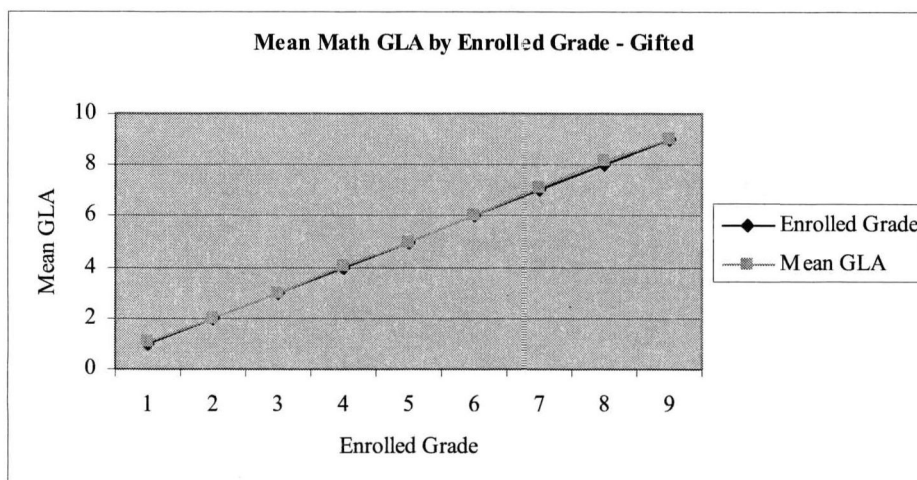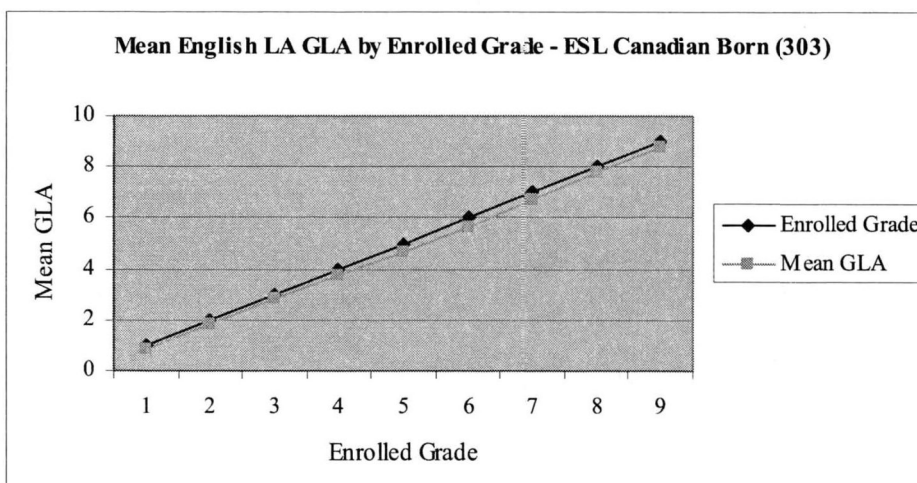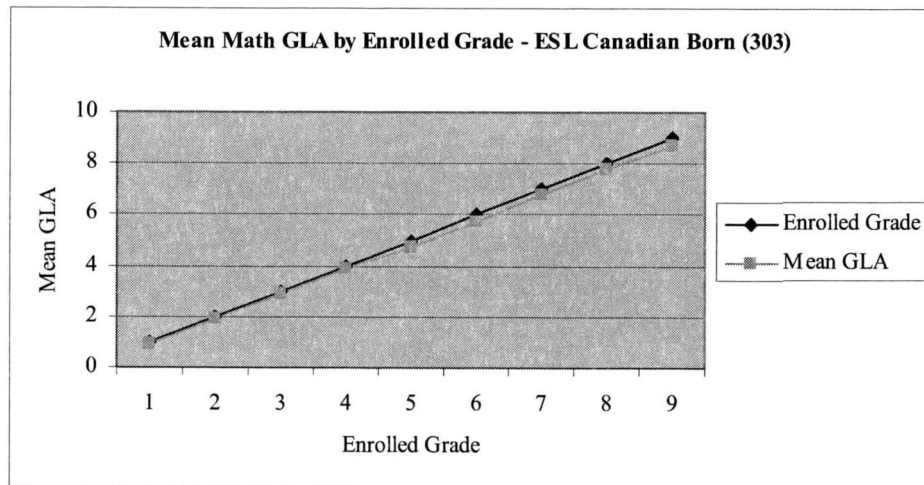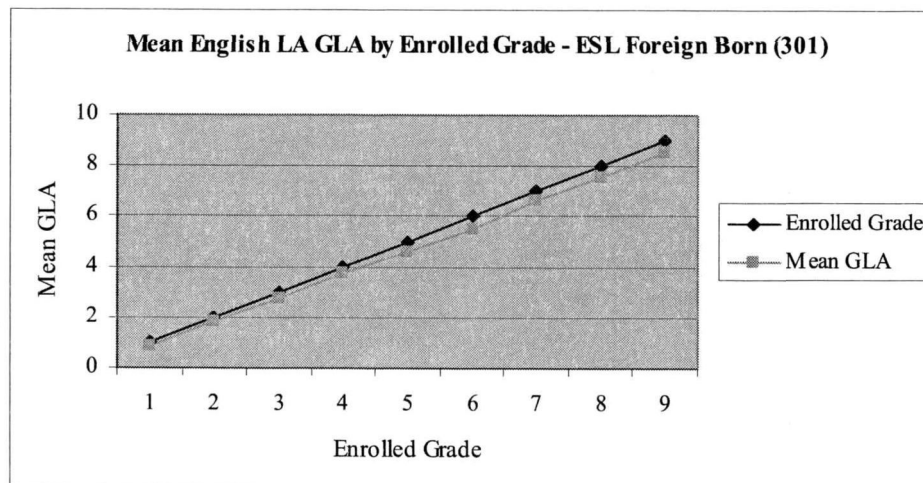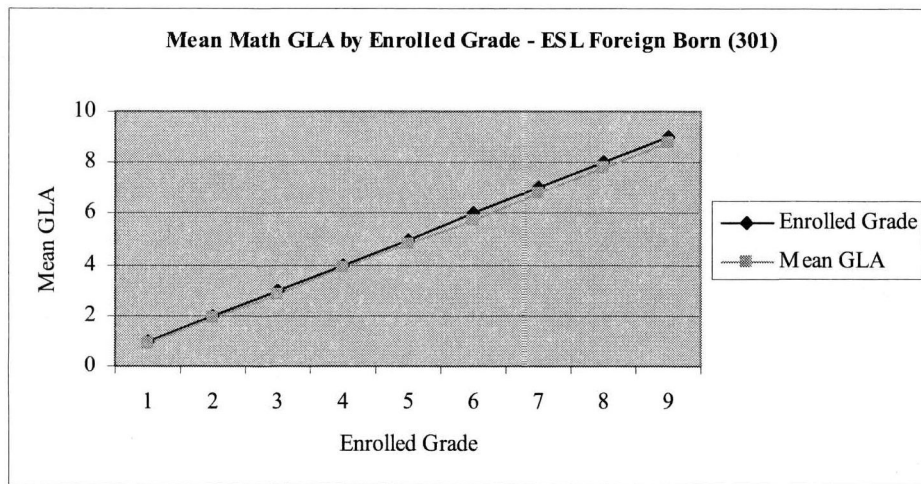


## Discussion

The graphs above yield some interesting observations:

- The relationship between enrolled grade and GLA for non-coded students is very close as was expected.
- The variance between enrolled grade and GLA tends to increase through the elementary grades and peaks at grade 6 and grade 9 for students with a severe disability.
- A similar pattern is seen for students with a mild/moderate disability, but the peak in grade nine is absent.
- Gifted students are more likely to have a GLA above enrolled grade in Mathematics than in Language Arts.
- Foreign-born and Canadian-born ESL students' GLA distributions are relatively similar.
- Foreign-born ESL students seem to have a GLA on par with their enrolled grade in mathematics up until Grade 5. In English Language Arts the two variables diverge as early as Grade 2.

## Birth Month-Combined Grades

The following table shows the breakdown of student birth month. When grade levels are combined there is a relatively equal distribution of students across birth months, but with fewer students in the second January and February categories.

Table 34 – Student Birth Month

| Student Birth Month | | |
|---|---|---|
| **Month** | **Frequency** | **Percentage** |
| 1st January | 11,177 | 5.7% |
| 1st February | 11,912 | 6.1% |
| March | 17,987 | 9.2% |
| April | 17,778 | 9.1% |
| May | 18,457 | 9.5% |
| June | 17,424 | 8.9% |
| July | 17,676 | 9.1% |
| August | 17,037 | 8.7% |
| September | 16,202 | 8.3% |
| October | 14,840 | 7.6% |
| November | 12,865 | 6.6% |
| December | 10,944 | 5.6% |
| 2nd January | 6,380 | 3.3% |
| 2nd February | 4,409 | 2.3% |
| **Total** | 195,088* | 100.0% |

*Not all students were included in this table as some students were outside the parameters of analysis meaning they were much older than the students being examined in this table.

The table above illustrates the distribution of students by birth month for all grades of students. The distribution was calculated by examining each grade individually and then combining all grades. Students in the 1st January and February are usually the oldest students in each grade, whereas students in the 2nd January and February are the youngest in each grade.

## GLA and PAT by Age within Grade Cohorts

Previous Alberta Education studies have indicated that there is a relative age effect between average PAT scores and birth month within grade cohorts, where older students tend to have higher average test scores than the younger students when measured by the z-score of average PAT results for each birth month group (Alberta Learning, 2001).

A comparative analysis was undertaken using GLA data. The percentages of students 'at or above' their grade level in English Language Arts and Math were converted to z-scores[8] and plotted. (See graphs below). There is a noticeable age effect Grades 1 through 5, which is most pronounced in Grade 1. In Grade 1, 1st January to October are statistically significant when compared to 2nd January and 2nd February.

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[8] Z-scores or standard scores convert a distribution of a set of scores to a normal distribution that allows a more consistent analysis of the data. A z-score of +1.0 represents a score equal to one standard deviation above the mean.

The following graphs were produced using the z-scores for Grades 1 through 5, English Language Arts GLAs for students in the GLA dataset.

**Z-score of the percent of students at or above grade level in Language Arts, by birth month within cohort - Grade 1 students**



**Z-score of the percent of students at or above grade level in Language Arts, by birth month within cohort - Grade 2 students**

Z-score of the percent of students at or above grade level in Language Arts, by birth month within cohort - Grade 3 students
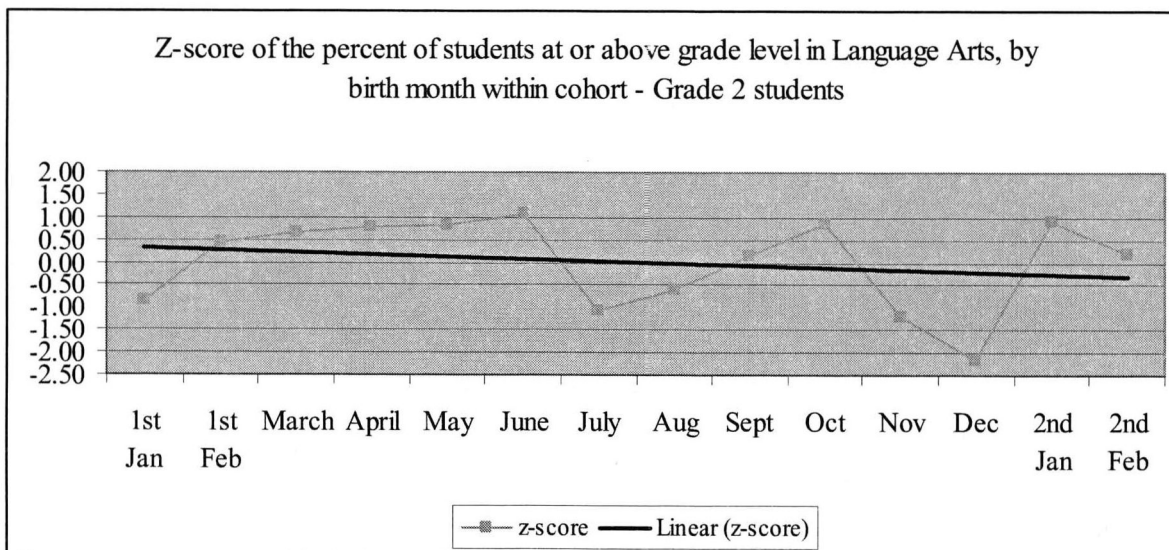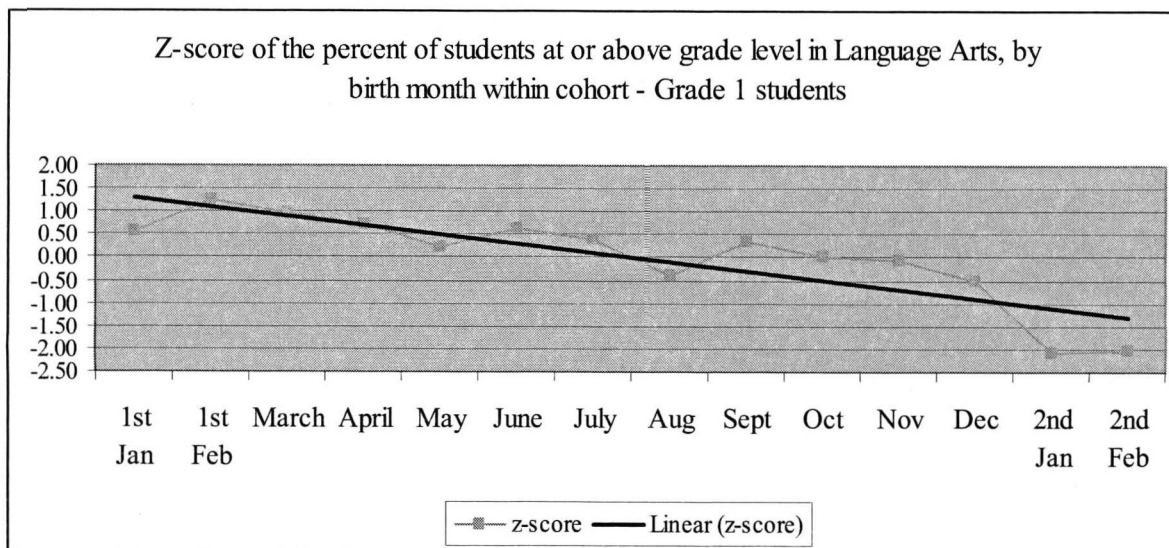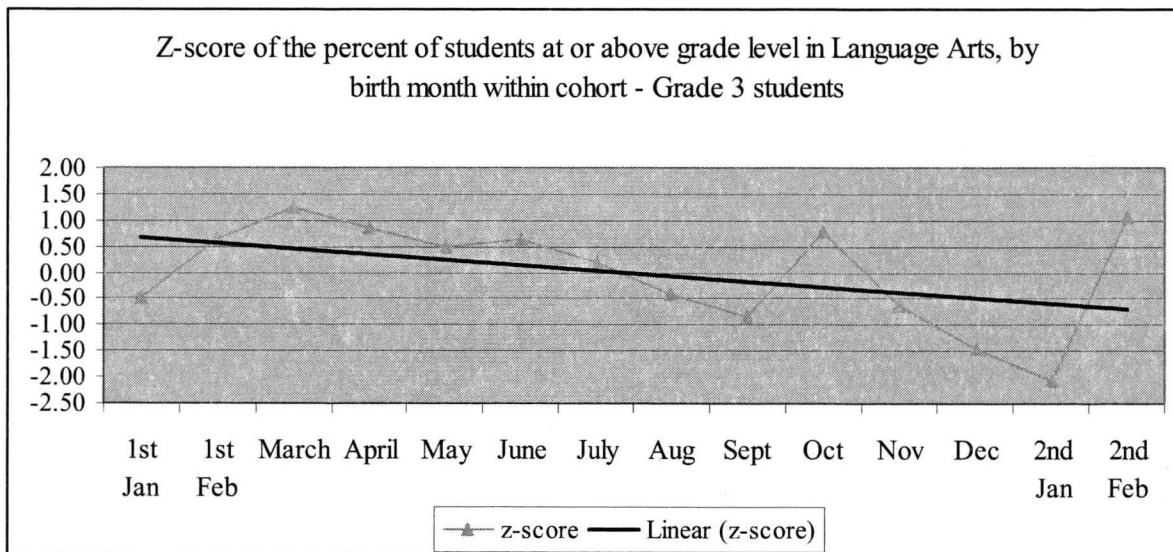
The graph below demonstrates that when PAT scores are recoded into "percent at or above acceptable" to mimic the GLA data, the relative age effect remains. In Grade 3, March and April are statistically significant when compared to $2^{nd}$ January.



Z-score of the percent of students at acceptable or above on the Language Arts PAT, by birth month within cohort - Grade 3 students

**Z-score of the percent of students at or above grade level in Language Arts, by birth month within cohort - Grade 4 students**



**Z-score of the percent of students at or above grade level in Language Arts, by birth month within cohort - Grade 5 students**
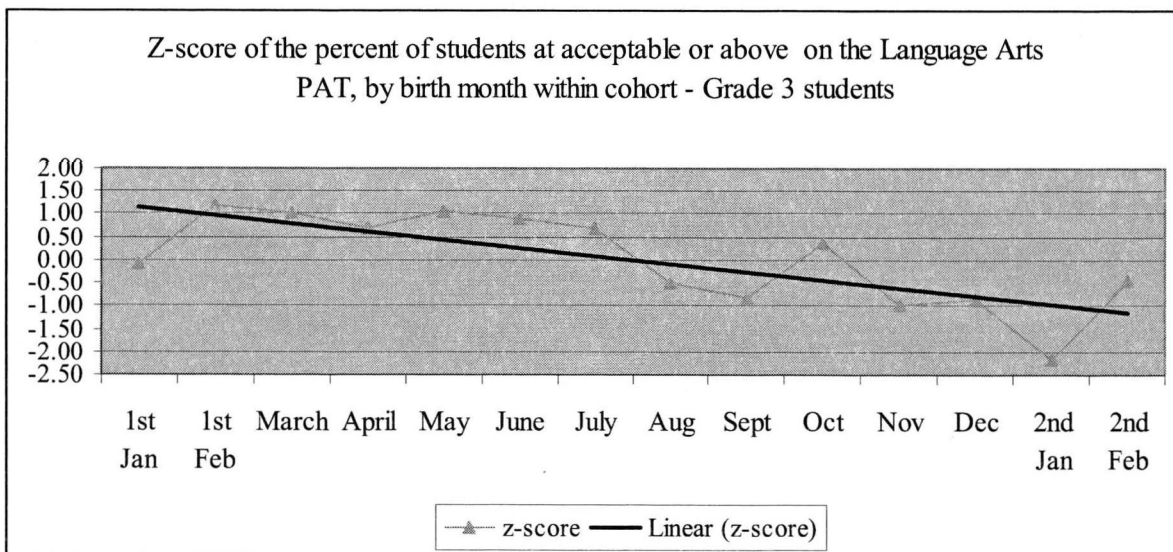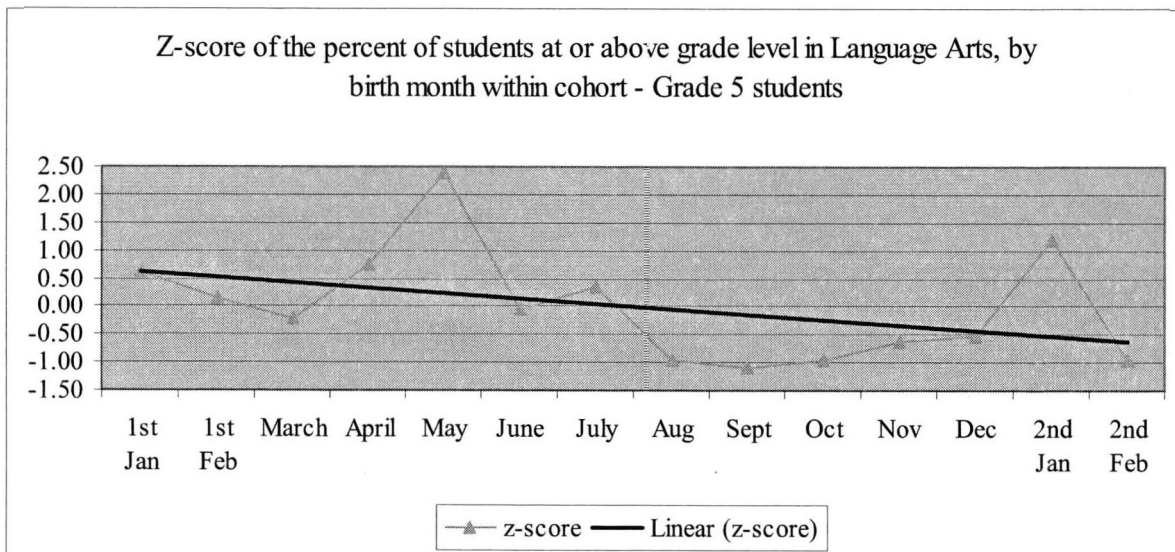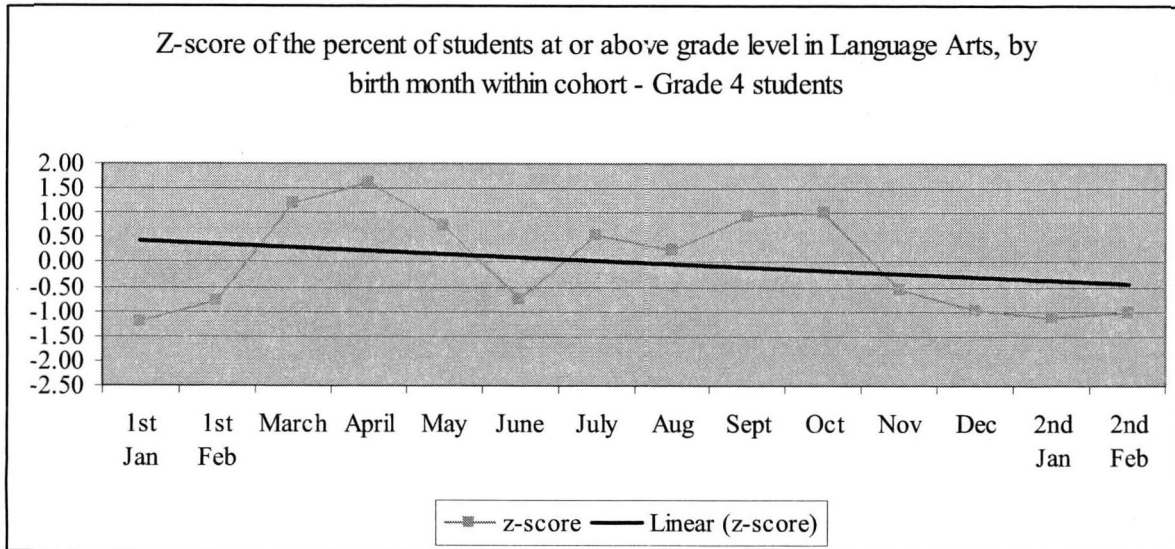


In Grade 5, May is statistically significant when compared to August, September and October.

**Discussion**

The age effect, which illustrates that younger students achieve at a lower level than those students born earlier in the year, is apparent in English Language Arts in Grades 1 through 5. After Grade 5, the age effect tapers off and is no longer apparent. In this sample the age effect persisted longer than in previous analyses of GLA data where the effect dissipated by Grade 3.

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# GLA at a Glance

The following table shows all groups of students and their GLA in Mathematics and English Language Arts including students for whom GLA data was either not available or not applicable.

Table 35 - GLA Overall Summary Table, Including 'GLA NA'

| Overall Summary Table | | Mathematics | | | English Language Arts | | |
|---|---|---|---|---|---|---|---|
| Student Codes | Frequency | % At or Above | % Below | % GLA NA | % At or Above | % Below | % GLA NA |
| Provincial Sample | 217,302 | 88.1% | 9.8% | 2.1% | 85.4% | 11.1% | 3.5% |
| Non coded | 170,637 | 92.4% | 6.1% | 1.5% | 90.6% | 6.6% | 2.9% |
| Severe Disability | 5,303 | 55.3% | 38.1% | 6.5% | 53.7% | 39.6% | 6.7% |
| - Emotional/Behavioural Disability | 2,925 | 58.8% | 35.9% | 5.2% | 56.7% | 38.0% | 5.3% |
| - Physical or Medical Disability | 1,976 | 52.7% | 39.6% | 7.6% | 52.4% | 40.0% | 7.7% |
| - Multiple Disability | 204 | 28.9% | 56.4% | 14.7% | 27.0% | 56.9% | 16.2% |
| - Deafness | 117 | 46.2% | 46.2% | 7.7% | 35.9% | 54.7% | 9.4% |
| - Blindness | 68 | 77.9% | 20.6% | 1.5% | 72.1% | 25.0% | 2.9% |
| Mild/Moderate Disability | 16,769 | 56.2% | 39.9% | 3.8% | 51.9% | 44.3% | 3.8% |
| - Learning Disability | 7,726 | 60.2% | 37.4% | 2.3% | 55.1% | 43.0% | 1.9% |
| - Mild Cognitive Disability | 2,923 | 21.6% | 68.7% | 9.7% | 21.0% | 69.8% | 9.2% |
| - Communication Disability | 2,330 | 72.1% | 25.3% | 2.5% | 59.8% | 36.1% | 4.1% |
| - Emotional/Behavioural Disability | 1,766 | 69.6% | 27.9% | 2.4% | 72.1% | 25.8% | 2.2% |
| - Physical/Medical Disability | 870 | 70.2% | 26.7% | 2.9% | 67.7% | 28.6% | 3.7% |
| - Multiple Disability | 862 | 53.3% | 44.4% | 2.2% | 48.6% | 48.8% | 2.6% |
| - Hearing Disability | 173 | 76.3% | 20.2% | 3.5% | 76.3% | 20.8% | 2.9% |
| - Moderate Cognitive Disability | 93 | 11.8% | 64.5% | 23.7% | 9.7% | 67.7% | 22.6% |
| - Visual Disability | 25 | 96.0% | 4.0% | 0.0% | 92.0% | 8.0% | 0.0% |
| | | | | | | | |
| Provincial Sample | 217,302 | 88.1% | 9.8% | 2.1% | 85.4% | 11.1% | 3.5% |
| Gifted | 3,314 | 96.9% | 2.2% | 0.9% | 96.8% | 2.3% | 0.7% |
| ESL Cdn-Born | 11,795 | 83.6% | 12.6% | 3.8% | 77.6% | 16.1% | 6.2% |
| ESL Foreign-Born | 11,139 | 83.4% | 11.3% | 5.3% | 72.3% | 18.5% | 9.1% |
| Gender | | | | | | | |
| - Males | 111,372 | 87.2% | 10.6% | 2.2% | 83.2% | 13.3% | 3.6% |
| - Females | 105,930 | 89.1% | 9.0% | 1.9% | 87.9% | 8.8% | 3.3% |
| Student Mobility | | | | | | | |
| - High | 58,220 | 81.7% | 15.4% | 2.9% | 80.2% | 16.3% | 3.4% |
| - Low | 159,074 | 90.5% | 7.8% | 1.8% | 87.4% | 9.2% | 3.5% |
| Birth Month | | | | | | | |
| - March to Sept | 122,561 | 89.6% | 8.6% | 1.9% | 87.1% | 9.6% | 3.3% |
| - Oct to 2$^{nd}$ Feb | 49,438 | 88.8% | 9.2% | 2.0% | 86.1% | 10.5% | 3.4% |

Note: The categories of 'at grade level' and 'above grade level' have been combined. There are not enough cases in the 'above grade level' category to be shown separately.

The following table shows all groups of students and their GLA in Mathematics and English Language Arts excluding students for whom GLA data was either not available or not applicable. In this table asterisks indicate significant differences between a specific cohort of students and the non-coded cohort. This analysis is important as it points to factors that may be limiting academic success for cohorts of students who are most at risk of under-achievement and thus would benefit from more focused systemic responsiveness to their learning needs.

Table 36 - GLA Overall Summary Table, Excluding 'GLA NA'

| Overall Summary Table | Mathematics | | | English Language Arts | | |
|---|---|---|---|---|---|---|
| Student Codes | Frequency | % At or Above | % Below | Frequency | % At or Above | % Below |
| Provincial Sample | 212,801 | 90.0% | 10.0% | 209,804 | 88.5% | 11.5% |
| Non coded | 168,053 | 93.8% | 6.2% | 165,746 | 93.2% | 6.8% |
| Severe Disability | 4,957 | 59.2%* | 40.8%* | 4,948 | 57.5%* | 42.5%* |
| - Emotional/Behavioural Disability | 2,773 | 62.1% | 37.9% | 2,771 | 59.9% | 40.1% |
| - Physical or Medical Disability | 1,825 | 57.2% | 42.8% | 1,824 | 56.7% | 43.3% |
| - Multiple Disability | 174 | 33.9% | 66.1% | 171 | 32.2% | 67.8% |
| - Deafness | 108 | 50.0% | 50.0% | 106 | 39.6% | 60.4% |
| - Blindness | 67 | 79.1% | 20.9% | 66 | 74.2% | 25.8% |
| Mild/Moderate Disability | 16,133 | 58.5%* | 41.5%* | 16,139 | 54.0%* | 46.0%* |
| - Learning Disability | 7,549 | 61.7% | 38.3% | 7,578 | 56.1% | 43.9% |
| - Mild Cognitive Disability | 2,638 | 23.9% | 76.1% | 2,653 | 23.2% | 76.8% |
| - Communication Disability | 2,271 | 74.1% | 25.9% | 2,235 | 62.3% | 37.7% |
| - Emotional/Behavioural Disability | 1,723 | 71.4% | 28.6% | 1,728 | 73.7% | 26.3% |
| - Physical/Medical Disability | 844 | 72.4% | 27.6% | 838 | 70.3% | 29.7% |
| - Multiple Disability | 843 | 54.6% | 45.4% | 840 | 49.9% | 50.1% |
| - Hearing Disability | 167 | 79.0% | 21.0% | 168 | 78.6% | 21.4% |
| - Moderate Cognitive Disability | 71 | 15.5% | 84.5% | 72 | 12.5% | 87.5% |
| - Visual Disability | 25 | 96.0% | 4.0% | 25 | 92.0% | 8.0% |
| | | | | | | |
| Provincial Sample | 212,801 | 90.0% | 10.0% | 209,804 | 88.5% | 11.5% |
| Gifted | 3,284 | 97.7%* | 2.3%* | 3,289 | 97.6%* | 2.4%* |
| ESL Cdn-Born | 11,350 | 87.0%* | 13.0%* | 11,059 | 82.8%* | 17.2%* |
| ESL Foreign-Born | 10,554 | 88.1%* | 11.9%* | 10,121 | 79.6%* | 20.4%* |
| Gender | | | | | | |
| - Males | 108,915 | 89.1%* | 10.9%* | 107,412 | 86.2%* | 13.7%* |
| - Females | 103,886 | 90.9%* | 9.1%* | 102,392 | 90.9%* | 9.1%* |
| Student Mobility | | | | | | |
| - High | 56,541 | 84.1%* | 15.9%* | 56,220 | 83.1%* | 16.9%* |
| - Low | 156,254 | 92.1%* | 7.9%* | 153,579 | 90.4%* | 9.6%* |
| Birth Month | | | | | | |
| - March to Sept | 120,281 | 91.3%* | 8.7%* | 118,533 | 90.0%* | 10.0%* |
| - Oct to Feb | 48,429 | 90.7%* | 9.3%* | 47,765 | 89.1%* | 10.9%* |

Note: The categories of 'at grade level' and 'above grade level' have been combined. There are not enough cases in the 'above grade level' category to be shown separately.
*Denotes a significant difference at p<0.001 when compared to the non-coded sample of students.
*Note: Statistical testing was only done with the larger categories, disability types (severe and mild/moderate) were not tested against the non-coded sample.*

# Comparison of GLA and PAT data

The GLA by PAT analysis demonstrates that GLA data can indeed supplement PAT data with reasonable reliability and validity.

### Correlations between PAT and GLA

Kendall's tau-b was used to measure the association between PAT and GLA. This particular test was chosen as it uses ordinal level data based on pair by pair comparisons. The chart below details the correlations for 2005-06 and 2006-07.

The PAT and GLA variables were re-coded into the dichotomous categories: either 'Below Acceptable', or 'At or Above Acceptable' for PATs; and either 'Below Grade Level' or 'At or Above Grade Level' for GLA, and then the two dichotomous variables were compared. All relationships tested were at the p <.01 levels meaning they were significant. The p-value shows that the observed relationships are not due to chance. The following tables shows all tau-b values for the relationships tested and from this, one can conclude that the relationships are moderate in strength. A perfect relationship of 1.0 between GLA and PAT is neither an expected nor a desirable condition given the inherent differences in the evaluation designs which would underlie potentially different learning outcomes being measured with different assessment methods.

### Table 37 - PAT by GLA Tau-b Calculations

**2005-06**

| PAT by GLA- Grade and Subject | Tau-b |
|---|---|
| Gr. 3 Eng. LA | .378 |
| Gr. 6 Eng. LA | .406 |
| Gr. 9 Eng. LA | .338 |
| Gr. 3 Math | .388 |
| Gr. 6 Math | .403 |
| Gr. 9 Math | .399 |

**2006-07**

| PAT by GLA- Grade and Subject | Tau-b |
|---|---|
| Gr. 3 Eng. LA | .324 |
| Gr. 6 Eng. LA | .337 |
| Gr. 9 Eng. LA | .323 |
| Gr. 3 Math | .342 |
| Gr. 6 Math | .366 |
| Gr. 9 Math | .409 |

When comparing 2005-06 to 2006-07, the strength of the relationships has decreased. This decrease in strength may be attributed to the larger sample size in 2006-07 and therefore may be a truer picture than the correlations of the previous year. The only exception is the increase in strength of the relationship between the Grade 9 PAT and GLA results.

# GLA by PAT Analysis-Comparisons Using Achievement Levels

In order to further examine the relationship between the GLA data and provincial achievement tests (PATs) and provide an additional perspective on these relationships, both PAT and GLA data were again re-coded into the categories of 'Below Grade Level and GLA NA' and 'At or Above Grade Level' for GLA; and 'Acceptable or Excellence' and 'Below Acceptable and Excused or Absent' for PATs. These groupings were chosen based on the current Alberta Education standard for cohort reporting. The groups were then cross-tabulated with the hypothesis being that students who score at or above the acceptable level on PATs tend to be at or above grade level, and likewise those that score below acceptable tend to be below grade level. The following tables show some support for the hypothesis, as 76-78% of the students in Language Arts and 65-80% of the students in Math who are at grade level are also at or above the acceptable level on the PATs. The data in the following tables includes all students from schools that submitted GLA data for 2006-07 in Grades 3, 6 or 9.

Table 38 - Comparison of English Language Arts PAT and GLA

| Comparison of English Language Arts PAT and GLA | | | | |
|---|---|---|---|---|
| | | Grade Level of Achievement – English Language Arts | | |
| | | At or Above Grade Level | Below Grade Level or GLA NA | Total |
| PAT - Grade 3 English Language Arts | Accept. or Excellence | 77.6% (17,304) | **5.7%** (1,276) | 83.4% (18,580) |
| | Below Accept., Excused or Absent | **8.1%** (1,801) | 8.5% (1,905) | 16.6% (3,706) |
| | Total | 85.7% (19,105) | 14.3% (3,181) | 100.0% (22,286) |
| PAT - Grade 6 English Language Arts | Accept. or Excellence | 77.9% (18,173) | **5.4%** (1,266) | 83.3% (19,439) |
| | Below Accept., Excused or Absent | **8.1%** (1,887) | 8.6% (2,014) | 16.7% (3,901) |
| | Total | 85.9% (20,060) | 14.1% (3,280) | 100.0% (23,340) |
| PAT – Grade 9 English Language Arts | Accept. or Excellence | 76.2% (17,489) | **4.3%** (982) | 80.5% (18,471) |
| | Below Accept., Excused or Absent | **10.8%** (2,483) | 8.7% (1,999) | 19.5% (4,482) |
| | Total | 87.0% (19,972) | 13.0% (2,981) | 100.0% (22,953) |

Note: All of the above observed relationships were significant when measured by Chi square. Bolded numbers represent inconsistent relationships between GLA and PAT data.

Table 39 - Comparison of Mathematics PAT and GLA

| **Comparison of Mathematics PAT and GLA** | | | | |
| --- | --- | --- | --- | --- |
| | | Grade Level of Achievement – Mathematics | | |
| | | At or Above Grade Level | Below Grade Level or GLA NA | Total |
| PAT - Grade 3 Mathematics | Accept. or Excellence | 79.6% (17,753) | **3.5%** (788) | 83.2% (18,541) |
| | Below Accept., Excused or Absent | **9.5%** (2,120) | 7.3% (1,632) | 16.8% (3,752) |
| | Total | 89.1% (19,873) | 10.9% (2,420) | 100.0% (22,293) |
| PAT - Grade 6 Mathematics | Accept. or Excellence | 74.0% (17,279) | **3.0%** (701) | 77.0% (17,980) |
| | Below Accept., Excused or Absent | **13.4%** (3,134) | 9.5% (2,226) | 23.0% (5,360) |
| | Total | 87.5% (20,413) | 12.5% (2,927) | 100.0% (23,340) |
| PAT – Grade 9 Mathematics | Accept. or Excellence | 65.8% (15,056) | **3.0%** (679) | 68.7% (15,735) |
| | Below Accept., Excused or Absent | **18.0%** (4,129) | 13.2% (3,022) | 31.2% (7,151) |
| | Total | 83.8% (19,185) | 16.2% (3,701) | 100.0% (22,886) |

Note: All of the above observed relationships were significant when measured by Chi square. Bolded numbers represent inconsistent relationships between GLA and PAT data.

It should be noted, in reviewing the above two tables, that more students are categorized as 'below grade level' in the PAT results than is true in GLA ratings. To illustrate, using the Mathematics table above, the following comparisons can be made:

Table 40 - Students below acceptable, excused or absent on the Mathematics PAT

| Test | Total # of Students | # Students At or Above GLA Grade level | Percent of Students At or Above GLA Grade Level |
| --- | --- | --- | --- |
| PAT Math 3 | 3,752 | 2,120 | 56.5% |
| PAT Math 6 | 5,360 | 3,134 | 58.5% |
| PAT Math 9 | 7,151 | 4,129 | 57.7% |

Table 41 - Students below grade level or GLA NA on GLA Mathematics

| Test | Total # of Students | # Students Acceptable or Excellent on PAT | Percent of Students Acceptable or Excellent on PAT |
|------|------|------|------|
| PAT Math 3 | 2,420 | 788 | 32.6% |
| PAT Math 6 | 2,927 | 701 | 23.9% |
| PAT Math 9 | 3,701 | 679 | 18.3% |

The following tables illustrate students below grade level on GLA and below acceptable on PAT in English Language Arts.

Table 42 - Students below acceptable, excused or absent on the English Language Arts PAT

| Test | Total # of Students | # Students At or Above GLA Grade level | Percent of Students At or Above GLA Grade Level |
|------|------|------|------|
| PAT ELA 3 | 3,706 | 1,801 | 48.6% |
| PAT ELA 6 | 3,901 | 1,887 | 48.4% |
| PAT ELA 9 | 4,482 | 2,483 | 55.4% |

Table 43 - Students below grade level or GLA NA on English Language Arts GLA

| Test | Total # of Students | # Students Acceptable or Excellent on PAT | Percent of Students Acceptable or Excellent on PAT |
|------|------|------|------|
| PAT ELA 3 | 3,181 | 1,276 | 40.1% |
| PAT ELA 6 | 3,280 | 1,266 | 38.6% |
| PAT ELA 9 | 2,981 | 982 | 32.9% |

It would appear from the above tables that while nearly half of the students who do not attain the acceptable standard on the PAT are considered at or above grade level, a smaller percentage of those who are considered below grade level are able to attain the acceptable standard on the PAT. This suggests that in terms of evaluating acceptable progress, the PAT is a more difficult standard to attain than is the GLA. The two assessments can be expected to demonstrate some variance because they are different forms of assessment, but both are designed to assess whether a student has met grade level standards. Therefore, one might expect that the variability would be seen as much in one direction as the other. The fact that this is not true suggests several possibilities: 1) that it may be more difficult for teachers to assign a 'below grade level' evaluation to one of their students than is the case for markers of the PAT assessments, 2) student performance on PATs may be attenuated by test anxiety; 3) students may perform better on many assessments over time than on a single paper and pencil test, or 4) a combination of these factors.

# Analysis of Students Below Grade Level

In this section the ratings given by teachers through the GLA are further compared to PAT results in Grades 3, 6 and 9. In each case, it is possible to identify the students who are rated as below grade level by their teachers (GLA) and those rated as below the acceptable standard by the PAT.

According to classical test theory (Crocker and Algina, 1986) all assessments are subject to some degree of test error. Given this fact the more achievement data available the clearer the true picture of a student's achievement becomes. One would expect some differences as well as complementary relationships in the designation of individuals in the two ratings provided by PAT and GLA data. Classroom assessment is based on an array of assessment methods over time for the GLA rating, ideally measuring the full and complete range of learning outcomes; whereas the PAT is a single, highly valid and reliable, selected and constructed response test that typically measures between 66% and 95% of the curricular outcomes in the tested subjects[9]. The PAT's are very likely the single best criterion-referenced assessment instrument available to the classroom teacher. Since the objective of both methods is to measure and provide evidence on how well a student is achieving as compared to the learning outcomes in the program of studies, one would expect a generally positive relationship between the students identified as "below" by both methods, and that is what we see in this data set. Where anomalous or inconsistent relationships are observed it presents the occasion to ask why and to delve deeper into the data to help understand why the measures differ.

An examination of the GLA pilot data for English Language Arts and Mathematics shows that this assumption departs most dramatically for Math 9.



Students Below Grade Level and Below Acceptable on PAT in English Language Arts

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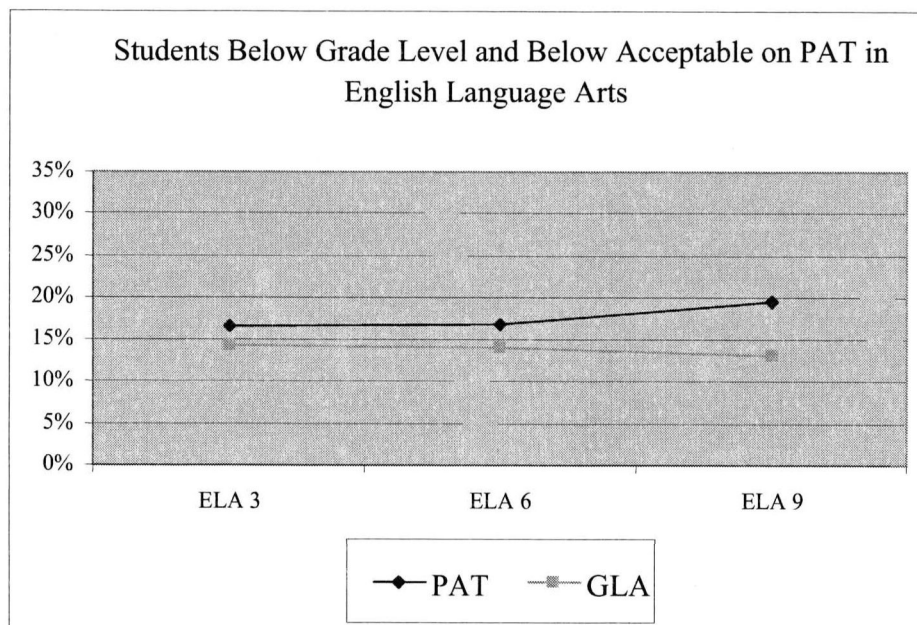
[9] These figures were obtained from a discussion paper presented to the Program and Accountability Advisory Committee, November 8, 2007.

Note: The data presented in the above tables are discrete data points. The lines were included to emphasize the patterns of the data.

**Students Below Grade Level or Below Acceptable on PAT in Mathematics**
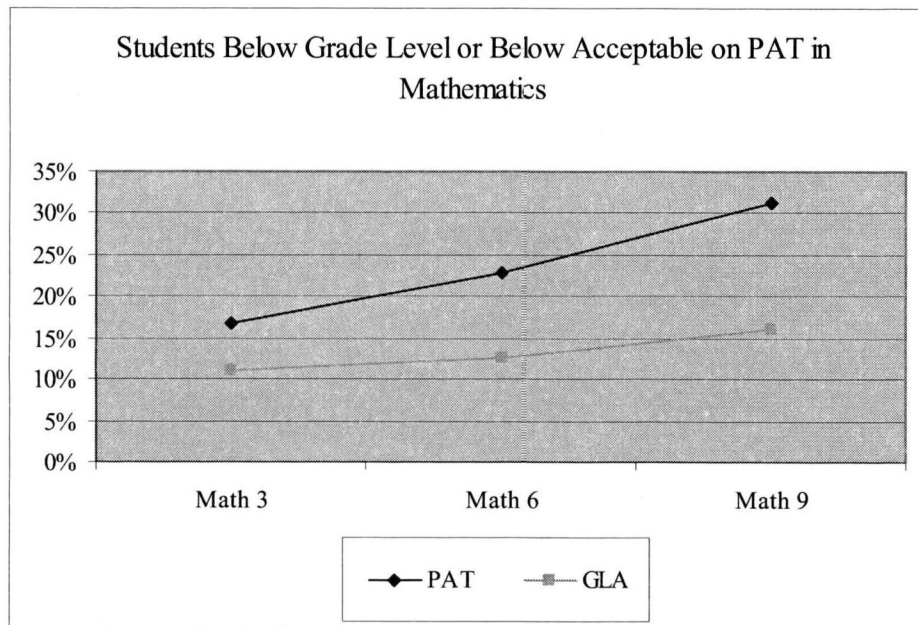


Note: The data presented in the above tables are discrete data points. The lines were included to emphasize the patterns of the data.

## Discussion

A primary reason for provincial aggregation of Grade Level of Achievement data is evaluation of education programs such as special education, English as a Second Language, etc. This observation is particularly relevant for those grades that do not have PAT testing where GLA can provide data that would otherwise not be available. Additionally, it is useful to be able to supplement PAT data with GLA data in Grades 3, 6 and 9 as the added advantage would be broader and richer data to inform program evaluation related decisions. An example is the analysis of students below grade level or the analysis of students missing PAT data found on the next few pages.

Further, the fact that the tau-b values show moderate strength lends credibility to the process of collecting GLA. A perfect relationship of 1.0 between GLA and PAT is neither an expected nor a desirable condition given the inherent differences underlying the evaluation designs. PAT data are derived from a single paper and pencil test whereas GLA data are based on numerous and more dynamic observations over time, and thus should be a much richer method of assessment, which one could reasonably assume to produce, positively correlated albeit different data than a PAT result. Considered together, PAT and GLA data provide a richer and more comprehensive picture of student achievement.

# GLA for Students Missing PAT Data

In order to determine whether GLA provides useful data for students for whom PAT data was unavailable, GLA data for these students was analyzed. Relative to the Grade 3, 6 and 9 students included in the 2006-07 GLA data set, the following table defines the breakdown of student categories and percent of students lacking PAT results and the corresponding GLA results.

Table 44 - Student Missing PAT Data Grade 3

| | | Student Code Groups | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Non Coded | Severe | Mild/Moderate | Gifted | ESL – Cdn-born | ESL – Foreign-born | All Students |
| **Grade 3 English Language Arts Students** | Total Eligible to write PAT | 17,405 | 605 | 1,398 | 151 | 1,642 | 1,320 | 22,376 |
| | % of students writing PAT | 96.1% | 64.1% | 72.5% | 98.7% | 92.9% | 81.7% | 93. 0% |
| **Grade 3 students with no PAT data** | %not writing PAT | 3.9% | 35.9% | 27.5% | 1.3% | 7.1% | 18.3% | 7.0% |
| | Below Grade Level | 194 | 130 | 314 | 0 | 52 | 76 | 731 |
| | At Grade Level or Above | 346 | 56 | 45 | 2 | 37 | 70 | 551 |
| | No GLA | 132 | 31 | 25 | 0 | 28 | 95 | 290 |
| | % with no GLA | 19.6% | 14.3% | 6.5% | 0.0% | 23.9% | 39.4% | 18.4% |
| | % of students with no PAT data having info using GLA | 80.4% | 85.7% | 93.5% | 100.0% | 76.1% | 60.6% | 81.6% |
| **% of Grade 3 students having info using GLA, PAT or both** | | 99.2% | 94.9% | 98.2% | 100.0% | 98.3% | 92.8% | 98.7% |

Grade 3 English Language Arts GLA data provided data for 82% of the population for whom no PAT data were previously available. Further, when GLA data are substituted, data are unavailable for only 5.1% of the sub-population coded severe (compared to 35.9% missing PAT data). Similarly, using GLA means data are unavailable for only 1.8% of the students in the dataset coded mild/moderate (compared to 27.5% using PAT data). Similar findings for Grades 6 and 9 in English Language Arts are summarized below.

Table 45 - Students Missing PAT Data Grade 6

| | | Student Code Groups | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Non Coded | Severe | Mild/Moderate | Gifted | ESL – Cdn-born | ESL – Foreign-born | All Students |
| **Grade 6 English Language Arts, Students** | Total Eligible to write PAT | 17,828 | 655 | 2,287 | 475 | 1,167 | 1,263 | 23,409 |
| | % of students writing PAT | 95.8% | 54.5% | 73.9% | 99.2% | 91.6% | 86.1% | 92.2% |
| **Grade 6 students with no PAT data** | %not writing PAT | 4.2% | 45.5% | 26.1% | 0.8% | 8.4% | 13.9% | 7.8% |
| | Below Grade Level | 177 | 193 | 508 | 0 | 66 | 76 | 958 |
| | At Grade Level or Above | 438 | 76 | 68 | 4 | 18 | 48 | 646 |
| | No GLA | 128 | 29 | 22 | 0 | 14 | 50 | 230 |
| | % with no GLA | 17.1% | 9.7% | 3.7% | 0.0% | 14.3% | 28.7% | 12.5% |
| | % of students with no PAT data having info using GLA | 82.9% | 90.3% | 96.3% | 100.0% | 85.7% | 71.3% | 87.5% |
| **% of Grade 6 students having info using GLA, PAT or both** | | 99.3% | 95.6% | 99.0% | 100.0% | 98.8% | 96.0% | 99.0% |

Table 46 - Students Missing PAT Data Grade 9

| | | Student Code Groups | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Non Coded | Severe | Mild/Moderate | Gifted | ESL – Cdn-born | ESL – Foreign-born | All Students |
| **Grade 9 English Language Arts Students** | Total Eligible to write PAT | 18,677 | 546 | 1,918 | 499 | 583 | 1,081 | 23,113 |
| | % of students writing PAT | 94.5% | 46.5% | 69.6% | 96.6% | 91.3% | 83.1% | 90.9% |
| **Grade 9 students with no PAT data** | %not writing PAT | 5.5% | 53.5% | 30.4% | 3.4% | 8.7% | 16.9% | 9.1% |
| | Below Grade Level | 225 | 135 | 315 | 1 | 27 | 86 | 755 |
| | At Grade Level or Above | 539 | 103 | 132 | 15 | 19 | 42 | 839 |
| | No GLA | 254 | 54 | 136 | 0 | 5 | 55 | 497 |
| | % with no GLA | 25.0% | 18.5% | 23.3% | 0.0% | 9.8% | 30.1% | 23.8% |
| | % of students with no PAT data having info using GLA | 75.0% | 81.5% | 76.7% | 100.0% | 90.2% | 69.9% | 76.2% |
| **% of Grade 9 students having info using GLA, PAT or both** | | 98.6% | 90.1% | 93.0% | 100.0% | 99.1% | 94.9% | 97.8% |

As the charts above demonstrate, GLA provides data for the majority of students who would otherwise not have any data provided.

## Analysis of Grade ELA Introduced for FLA Students

In the 2006-07 GLA pilot, schools were asked to enter the grade English Language Arts was introduced to French students. The following table shows the distribution of the grade in which ELA was introduced.

Table 47 - Grade ELA Introduced Distribution

| Grade ELA Intro | Frequency | Percent |
|---|---|---|
| 1 | 1,471 | 17.0% |
| 2 | 2,495 | 28.8% |
| 3 | 4,535 | 52.3% |
| 4 | 34 | 0.4% |
| 5 | 11 | 0.1% |
| 6 | 14 | 0.2% |
| 7 | 86 | 1.0% |
| 8 | 19 | 0.2% |
| 9 | 8 | 0.1% |
| Total | 8,673* | 100.0% |

*There were 4,013 students who did not have Grade ELA Introduced information

The majority of students had English Language Arts introduced in Grades 1 through 3. The following tables illustrate the French and English Language Arts GLA compared to the grade in which ELA was introduced. The tables only contain those students who had ELA introduced in Grades 1 through 3 as they are the largest group of students.

Table 48 - Grade ELA Introduced compared to French Language Arts GLA

| Grade ELA Intro | GLA Equal or Above | GLA Below | GLA NA | Count |
|---|---|---|---|---|
| 1 | 1,277 (86.8%) | 194 (13.2%) | 0 (0.0%) | 1,471 |
| 2 | 2,445 (98.0%) | 50 (2.0%) | 0 (0.0%) | 2,495 |
| 3 | 4,299 (94.8%) | 235 (5.2%) | 1 (0.0%) | 4,535 |

Note: All of the above observed relationships were significant when measured by Chi square.

Table 49 - Grade ELA Introduced compared to English Language Arts GLA

| Grade ELA Intro | GLA Equal or Above | GLA Below | GLA NA | Count |
|---|---|---|---|---|
| 1 | 1,271 (86.4%) | 200 (13.6%) | 0 (0.0%) | 1,471 |
| 2 | 2,434 (97.6%) | 61 (2.4%) | 0 (0.0%) | 2,495 |
| 3 | 4,358 (96.1%) | 176 (3.9%) | 1 (0.0%) | 4,535 |

Note: All of the above observed relationships were significant when measured by Chi square.

As the above tables illustrate, there are statistically significant relationships between the grade ELA introduced categories. When examining the GLA results for both FLA and ELA, students with an ELA introduced of Grade 2 seem to be the largest proportion of students attaining a GLA equal or above their enrolled grade.

Due to the variance of the grade in which ELA is introduced as shown in the above frequency table, it was decided that this field would continue to be reported in future GLA data submissions for French students.

## Analysis of Students with Multiple Years of GLA Data

There were 64,170 students involved in both the 2005-06 and 2006-07 GLA data collections. There were 82,390 student records submitted in 2005-06 and 220,682 in 2006-07 with 78% of the 2005-06 student cohort having data for both years. The following analysis is based only on those students for whom GLA data is available for both years and is presented only to illustrate the type of trend analysis that will become viable as the GLA initiative becomes implemented over several years.

Students enrolled grade in 2005-06 and 2006-07 are shown below.

| | Enrolled Grade | | | |
|---|---|---|---|---|
| | **2005-06** | | **2006-07** | |
| **Enrolled Grade** | **Frequency** | **Percent** | **Frequency** | **Percent** |
| 1 | 7,929 | 12.4% | 104 | .2% |
| 2 | 8,234 | 12.8% | 7,892 | 12.3% |
| 3 | 8,210 | 12.8% | 8,200 | 12.8% |
| 4 | 8,225 | 12.8% | 8,212 | 12.8% |
| 5 | 8,424 | 13.1% | 8,227 | 12.8% |
| 6 | 7,535 | 11.7% | 8,404 | 13.1% |
| 7 | 7,684 | 12.0% | 7,558 | 11.8% |
| 8 | 7,898 | 12.3% | 7,665 | 11.9% |
| 9 | 31 | .0% | 7,908 | 12.3% |
| Total | 64,170 | 100.0% | 64,170 | 100.0% |

The following table shows the English Language Arts GLA codes for all students submitting in both years.

Table 50 – All Students, English Language Arts

| All Students - English Language Arts | | | | |
|---|---|---|---|---|
| | 2005-06 | | 2006-07 | |
| | Number of students | Percent of total enrolled (%) | Number of students | Percent of total enrolled (%) |
| GLA below enrolled grade | 7,348* | 11.5% | 8,146* | 12.7% |
| GLA equal to enrolled grade | 54,938 | 85.6% | 54,903 | 85.6% |
| GLA above enrolled grade | 222* | 0.3% | 94* | 0.1% |
| GLA NA | 1,662* | 2.6% | 1,027* | 1.6% |
| Total | 64,170 | 100.0% | 64,170 | 100.0% |

*Indicates a significant difference between 2005-06 and 2006-07
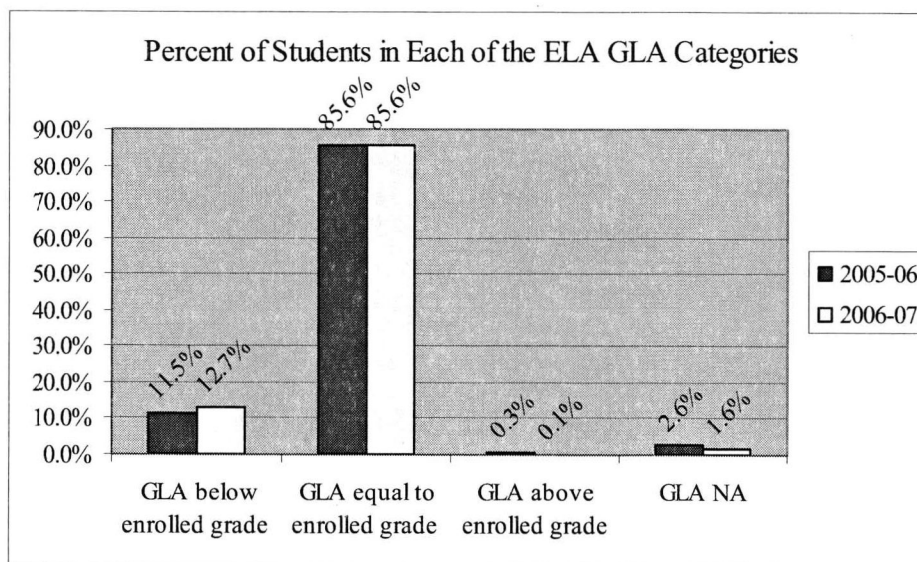


There is a drop in the number of students attaining the above grade level category and there is an increase in the number of students attaining below grade level. In Mathematics the same patterns emerge.

Table 51 – All Students, Mathematics

| All Students - Mathematics | | | | |
|---|---|---|---|---|
| | 2005-06 | | 2006-07 | |
| | Number of students | Percent of total enrolled (%) | Number of students | Percent of total enrolled (%) |
| GLA below enrolled grade | 5,348* | 8.3% | 7,181* | 11.2% |
| GLA equal to enrolled grade | 56,562* | 88.1% | 55,219* | 86.1% |
| GLA above enrolled grade | 396 | 0.6% | 466 | 0.7% |
| GLA NA | 1,864* | 2.9% | 1,304* | 2.0% |
| Total | 64,170 | 100.0% | 64,170 | 100.0% |

*Indicates a significant difference between 2005-06 and 2006-07

**Percent of Students in Each of the Math GLA Categories**



Legend: ■ 2005-06  □ 2006-07

Values shown on chart:
- GLA below enrolled grade: 8.3%, 11.2%
- GLA equal to enrolled grade: 88.1%, 86.1%
- GLA above enrolled grade: 0.6%, 0.7%
- GLA NA: 2.9%, 2.0%
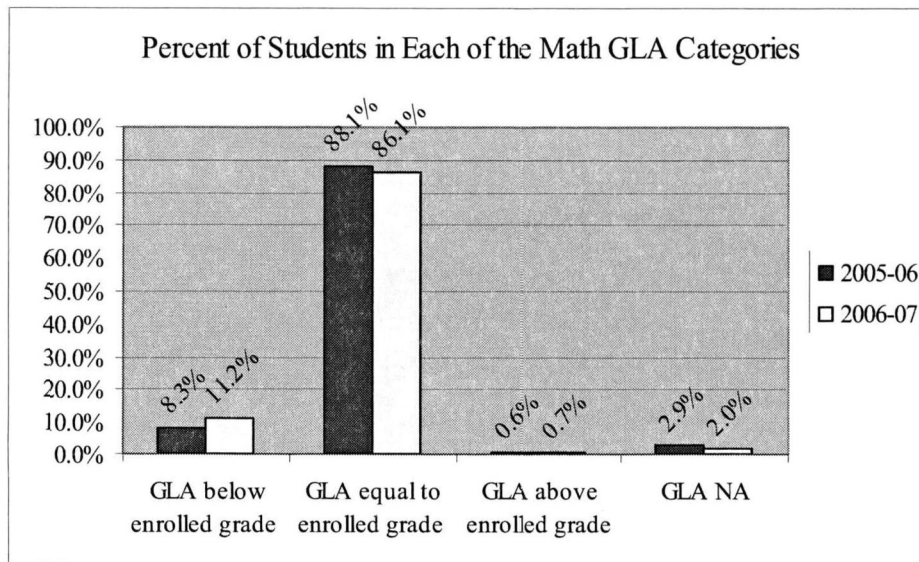
## Comparison of English Language Arts, 2005-06 to 2006-07

To better understand the student's changes in grade level of achievement from 2005-06 to 2006-07, the following tables were produced.

Table 52 – 2006-07 Results for Students At or Above Grade Level in 2005-06, English Language Arts

| Students At or Above Grade Level in 2005-06 - English Language Arts | | |
|---|---|---|
| | **2006-07** | |
| | **Number of students** | **Percent of total enrolled (%)** |
| GLA below enrolled grade | 3,234 | 5.9% |
| GLA equal to or above enrolled grade | 51,496 | 93.4% |
| GLA NA | 430 | 0.8% |
| **Total** | **55,160** | **100.0%** |

Table 53 – 2006-07 Results for Students Below Grade Level in 2005-06, English Language Arts

| Students Below Grade Level in 2005-06 - English Language Arts | | |
|---|---|---|
| | **2006-07** | |
| | **Number of students** | **Percent of total enrolled (%)** |
| GLA below enrolled grade | 4,674 | 63.6% |
| GLA equal to or above enrolled grade | 2,366 | 32.2% |
| GLA NA | 308 | 4.2% |
| **Total** | **7,348** | **100.0%** |

**Comparison of Mathematics, 2005-06 to 2006-07**

Table 54 – 2006-07 Results for Students At or Above Grade Level in 2005-06, Mathematics

| Students At or Above Grade Level in 2005-06 - Mathematics | | |
|---|---|---|
| | **2006-07** | |
| | **Number of students** | **Percent of total enrolled (%)** |
| GLA below enrolled grade | 3,580 | 6.3% |
| GLA equal to or above enrolled grade | 52,844 | 92.8% |
| GLA NA | 534 | 0.9% |
| **Total** | **56,958** | **100.0%** |

Table 55 – 2006-07 Results for Students Below Grade Level in 2005-06, Mathematics

| Students Below Grade Level in 2005-06 - Mathematics | | |
|---|---|---|
| | **2006-07** | |
| | **Number of students** | **Percent of total enrolled (%)** |
| GLA below enrolled grade | 3,373 | 63.1% |
| GLA equal to or above enrolled grade | 1,700 | 31.8% |
| GLA NA | 275 | 5.1% |
| **Total** | **5,348** | **100.0%** |

From the above tables it is apparent that in Mathematics, most students who were at or above grade level in 2005-06 attained the same categorization in the following year (92.8%). For students categorized as below grade level in 2005-06, 31.8% achieved a GLA equal to or above their enrolled grade in the following year. A similar pattern is shown for English Language Arts.

**Change in GLA by Enrolled Grade**
The following tables show students' GLA in English Language Arts and Mathematics for 2005-06 and 2006-07. In order to be part of this analysis, students had to have advanced an enrolled grade from 05-06 to 06-07. Five hundred (500) students were excluded from this analysis.

**Grade One to Grade Two**

| | Grade 1 - 05-06 | | Grade 2 – 06-07 | |
|---|---|---|---|---|
| **Grade Level** | **ELA** | **% of Total** | **ELA** | **% of Total** |
| N1 | 771 | 9.9 | 155 | 2.0 |
| 1 | **6,345** | **81.1** | 847 | 10.8 |
| 2 | 24 | 0.3 | **6,553** | **83.8** |
| 3 | 6 | 0.1 | 17 | 0.2 |
| 4 | 0 | 0.0 | 6 | 0.1 |
| Missing | 677 | 8.9 | 245 | 3.1 |
| **Total** | **7,823** | **100.0** | **7,823** | **100.0** |

| | Grade 1 - 05-06 | | Grade 2 – 06-07 | |
|---|---|---|---|---|
| **Grade Level** | **Math** | **% of Total** | **Math** | **% of Total** |
| N1 | 388 | 5.0 | 87 | 1.1 |
| 1 | **7,227** | **92.4** | 611 | 7.8 |
| 2 | 21 | 0.3 | **7,042** | **90.0** |
| 3 | 9 | 0.1 | 14 | 0.2 |
| 4 | 4 | 0.1 | 4 | 0.1 |
| Missing | 174 | 2.1 | 65 | 0.9 |
| **Total** | **7,823** | **100.0** | **7,823** | **100.0** |

## Grade Two to Grade Three

| Grade Level | Grade 2 – 05-06 ELA | % of Total | Grade 3 – 06-07 ELA | % of Total |
|---|---|---|---|---|
| N1 | 176 | 2.2 | 36 | 0.4 |
| 1 | 751 | 9.2 | 219 | 2.7 |
| 2 | **6,891** | **84.5** | 836 | 10.2 |
| 3 | 35 | 0.4 | **6,913** | **84.7** |
| 4 | 5 | 0.1 | 24 | 0.3 |
| 5 | 2 | 0.0 | 1 | 0.0 |
| Missing | 299 | 3.6 | 130 | 1.7 |
| **Total** | **8,159** | **100.0** | **8,159** | **100.0** |

| Grade Level | Grade 2 – 05-06 Math | % of Total | Grade 3 – 06-07 Math | % of Total |
|---|---|---|---|---|
| N1 | 93 | 1.1 | 26 | 0.3 |
| 1 | 389 | 4.8 | 117 | 1.4 |
| 2 | **7,466** | **91.5** | 684 | 8.4 |
| 3 | 43 | 0.5 | **7,198** | **88.2** |
| 4 | 1 | 0.0 | 35 | 0.4 |
| 5 | 0. | 0.0 | 0 | 0.0 |
| Missing | 167 | 2.1 | 99 | 1.2 |
| **Total** | **8,159** | **100.0** | **8,159** | **100.0** |

## Grade Three to Grade Four

| Grade Level | Grade 3 – 05-06 ELA | % of Total | Grade 4 – 06-07 ELA | % of Total |
|---|---|---|---|---|
| N1 | 68 | 0.8 | 15 | 0.2 |
| 1 | 210 | 2.6 | 90 | 1.1 |
| 2 | 689 | 8.4 | 221 | 2.7 |
| 3 | **7,033** | **86.2** | 803 | 9.8 |
| 4 | 24 | 0.3 | **6,963** | **85.3** |
| 5 | 0 | 0.0 | 15 | 0.2 |
| 6 | 0 | 0.0 | 0 | 0.0 |
| Missing | 139 | 1.7 | 56 | 0.7 |
| **Total** | **8,163** | **100.0** | **8,163** | **100.0** |

| Grade Level | Grade 3 – 05-06 Math | % of Total | Grade 4 – 06-07 Math | % of Total |
|---|---|---|---|---|
| N1 | 42 | 0.5 | 5 | 0.1 |
| 1 | 148 | 1.8 | 42 | 0.5 |
| 2 | 454 | 5.6 | 203 | 2.5 |
| 3 | **7,327** | **89.8** | 633 | 7.8 |
| 4 | 55 | 0.7 | **7,203** | **88.2** |
| 5 | 1 | 0.0 | 23 | 0.3 |
| 6 | 0 | 0.0 | 1 | 0.0 |
| Missing | 136 | 1.6 | 53 | 0.6 |
| **Total** | **8,163** | **100.0** | **8,163** | **100.0** |

## Grade Four to Grade Five

| Grade Level | Grade 4 – 05-06 ELA | % of Total | Grade 5 – 06-07 ELA | % of Total |
|---|---|---|---|---|
| N1 | 38 | 0.5 | 11 | 0.1 |
| 1 | 108 | 1.3 | 45 | 0.6 |
| 2 | 244 | 3.0 | 110 | 1.3 |
| 3 | 614 | 7.5 | 274 | 3.4 |
| 4 | **6,998** | **85.6** | 742 | 9.1 |
| 5 | 18 | 0.2 | **6,927** | **84.8** |
| 6 | 5 | 0.1 | 6 | 0.1 |
| 7 | 1 | 0.0 | 1 | 0.0 |
| 8 | 0 | 0.0 | | |
| Missing | 147 | 1.8 | 57 | 0.6 |
| **Total** | **8,173** | **100.0** | **8,173** | **100.0** |

| Grade Level | Grade 4 – 05-06 Math | % of Total | Grade 5 – 06-07 Math | % of Total |
|---|---|---|---|---|
| N1 | 25 | 0.3 | 4 | 0.0 |
| 1 | 60 | 0.7 | 42 | 0.5 |
| 2 | 213 | 2.6 | 95 | 1.2 |
| 3 | 416 | 5.1 | 244 | 3.0 |
| 4 | **7,273** | **89.0** | 589 | 7.2 |
| 5 | 28 | 0.3 | **7,118** | **87.1** |
| 6 | 1 | 0.0 | 28 | 0.3 |
| 7 | 0 | 0.0 | 1 | 0.0 |
| 8 | 1 | 0.0 | | |
| Missing | 156 | 2.0 | 52 | 0.6 |
| **Total** | **8,173** | **100.0** | **8,173** | **100.0** |

## Grade Five to Grade Six

| Grade Level | Grade 5 – 05-06 | | Grade 6 – 06-07 | |
|---|---|---|---|---|
| | ELA | % of Total | ELA | % of Total |
| N1 | 25 | 0.3 | 8 | 0.1 |
| 1 | 45 | 0.5 | 20 | 0.2 |
| 2 | 140 | 1.7 | 62 | 0.7 |
| 3 | 292 | 3.5 | 141 | 1.7 |
| 4 | 561 | 6.7 | 281 | 3.4 |
| 5 | **7,179** | **85.9** | 675 | 8.1 |
| 6 | 14 | 0.2 | **7,110** | **85.0** |
| 7 | 6 | 0.1 | 6 | 0.1 |
| 8 | 0 | 0.0 | 3 | 0.0 |
| 9 | 0 | 0.0 | | |
| Missing | 99 | 1.1 | 55 | 0.7 |
| **Total** | **8,361** | **100.0** | **8,361** | **100.0** |

| Grade Level | Grade 5 – 05-06 | | Grade 6 – 06-07 | |
|---|---|---|---|---|
| | Math | % of Total | Math | % of Total |
| N1 | 17 | 0.2 | 5 | 0.1 |
| 1 | 26 | 0.3 | 12 | 0.1 |
| 2 | 109 | 1.3 | 46 | 0.6 |
| 3 | 208 | 2.5 | 122 | 1.5 |
| 4 | 474 | 5.7 | 249 | 3.0 |
| 5 | **7,369** | **88.1** | 615 | 7.4 |
| 6 | 27 | 0.3 | **7,244** | **86.6** |
| 7 | 1 | 0.0 | 21 | 0.3 |
| 8 | 1 | 0.0 | 1 | 0.0 |
| 9 | 0 | 0.0 | 1 | 0.0 |
| Missing | 129 | 1.6 | 45 | 0.5 |
| **Total** | **8,361** | **100.0** | **8,361** | **100.0** |

## Grade Six to Grade Seven

| Grade Level | Grade 6 – 05-06 | | Grade 7 – 06-07 | |
|---|---|---|---|---|
| | ELA | % of Total | ELA | % of Total |
| N1 | 16 | 0.2 | 3 | 0.0 |
| 1 | 14 | 0.2 | 4 | 0.1 |
| 2 | 61 | 0.8 | 18 | 0.2 |
| 3 | 170 | 2.3 | 51 | 0.7 |
| 4 | 247 | 3.3 | 83 | 1.1 |
| 5 | 444 | 5.9 | 149 | 2.0 |
| 6 | **6,408** | **85.5** | 404 | 5.4 |
| 7 | 11 | 0.1 | **6,618** | **88.3** |
| 8 | 1 | 0.0 | 6 | 0.1 |
| 9 | 0 | 0.0 | 0 | 0.0 |
| Missing | 124 | 1.7 | 160 | 2.1 |
| **Total** | **7,496** | **100.0** | **7,496** | **100.0** |

| Grade Level | Grade 6 – 05-06 | | Grade 7 – 06-07 | |
|---|---|---|---|---|
| | Math | % of Total | Math | % of Total |
| N1 | 15 | 0.2 | 6 | 0.1 |
| 1 | 11 | 0.1 | 2 | 0.0 |
| 2 | 41 | 0.5 | 8 | 0.1 |
| 3 | 140 | 1.9 | 42 | 0.6 |
| 4 | 198 | 2.6 | 88 | 1.2 |
| 5 | 315 | 4.2 | 121 | 1.6 |
| 6 | **6,601** | **88.1** | 426 | 5.7 |
| 7 | 11 | 0.1 | **6,372** | **85.0** |
| 8 | 5 | 0.1 | 102 | 1.4 |
| 9 | 0 | 0.0 | 31 | 0.4 |
| Missing | 159 | 2.2 | 298 | 4.0 |
| **Total** | **7,496** | **100.0** | **7,496** | **100.0** |

## Grade Seven to Grade Eight

| Grade Level | Grade 7 – 05-06 | | Grade 8 – 06-07 | |
|---|---|---|---|---|
| | ELA | % of Total | ELA | % of Total |
| N1 | 12 | 0.2 | 2 | 0.0 |
| 1 | 2 | 0.0 | 2 | 0.0 |
| 2 | 28 | 0.4 | 16 | 0.2 |
| 3 | 54 | 0.7 | 26 | 0.3 |
| 4 | 128 | 1.7 | 61 | 0.8 |
| 5 | 181 | 2.4 | 86 | 1.1 |
| 6 | 270 | 3.5 | 151 | 2.0 |
| 7 | **6,817** | **89.4** | 543 | 7.1 |
| 8 | 17 | 0.2 | **6,592** | **86.4** |
| 9 | 4 | 0.1 | 4 | 0.1 |
| 10 | 0 | 0.0 | 0 | 0.0 |
| 11 | 0 | 0.0 | 0 | 0.0 |
| Missing | 116 | 1.4 | 146 | 2.0 |
| **Total** | **7,629** | **100.0** | **7,629** | **100.0** |

| Grade Level | Grade 7 – 05-06 | | Grade 8 – 06-07 | |
|---|---|---|---|---|
| | Math | % of Total | Math | % of Total |
| N1 | 10 | 0.1 | 3 | 0.0 |
| 1 | 1 | 0.0 | 1 | 0.0 |
| 2 | 16 | 0.2 | 8 | 0.1 |
| 3 | 39 | 0.5 | 22 | 0.3 |
| 4 | 88 | 1.2 | 50 | 0.7 |
| 5 | 147 | 1.9 | 66 | 0.9 |
| 6 | 336 | 4.4 | 150 | 2.0 |
| 7 | **6,468** | **84.8** | 668 | 8.8 |
| 8 | 96 | 1.3 | **6,228** | **81.6** |
| 9 | 0 | 0.0 | 126 | 1.7 |
| 10 | 0 | 0.0 | 4 | 0.1 |
| 11 | 0 | 0.0 | 2 | 0.0 |
| Missing | 428 | 5.6 | 301 | 3.9 |
| **Total** | **7,629** | **100.0** | **7,629** | **100.0** |

**Grade Eight to Grade Nine**

| Grade Level | Grade 8 – 05-06 | | Grade 9 – 06-07 | |
|---|---|---|---|---|
| | ELA | % of Total | ELA | % of Total |
| N1 | 7 | 0.1 | 5 | 0.1 |
| 1 | 4 | 0.1 | 6 | 0.1 |
| 2 | 10 | 0.1 | 5 | 0.1 |
| 3 | 38 | 0.5 | 20 | 0.3 |
| 4 | 58 | 0.7 | 28 | 0.4 |
| 5 | 93 | 1.2 | 41 | 0.5 |
| 6 | 145 | 1.8 | 81 | 1.0 |
| 7 | 272 | 3.5 | 123 | 1.6 |
| 8 | **7,151** | **90.9** | 561 | 7.1 |
| 9 | 38 | 0.5 | **6,830** | **86.8** |
| 10 | 1 | 0.0 | 2 | 0.0 |
| Missing | 49 | 0.6 | 164 | 2.0 |
| **Total** | **7,866** | **100.0** | **7,866** | **100.0** |

| Grade Level | Grade 8 – 05-06 | | Grade 9 – 06-07 | |
|---|---|---|---|---|
| | Math | % of Total | Math | % of Total |
| N1 | 6 | 0.1 | 4 | 0.1 |
| 1 | 1 | 0.0 | 1 | 0.0 |
| 2 | 3 | 0.0 | 5 | 0.1 |
| 3 | 23 | 0.3 | 12 | 0.2 |
| 4 | 51 | 0.6 | 33 | 0.4 |
| 5 | 88 | 1.1 | 30 | 0.4 |
| 6 | 123 | 1.6 | 70 | 0.9 |
| 7 | 300 | 3.8 | 118 | 1.5 |
| 8 | **6,686** | **85.0** | 758 | 9.6 |
| 9 | 81 | 1.0 | **6,395** | **81.3** |
| 10 | 0 | 0.0 | 68 | 0.9 |
| Missing | 504 | 6.5 | 372 | 4.7 |
| **Total** | **7,866** | **100.0** | **7,866** | **100.0** |

The tables above illustrate interesting patterns of grade level achievement. For students who are evaluated as being below grade level, there are many that have a grade level of achievement that is more than one grade below their enrolled grade. It is interesting to note that in Mathematics, every group of students in the 2005-06 cohort, the percent of students at grade level decreases from 2005-06 to 2006-07.

## Conclusions

This report described the processes and outcomes associated with the 2006-07 Grade Level of Achievement (GLA) pilot data collection, data management and data analysis. The key questions addressed by this report were 1) can GLA data be collected and reported on a consistent basis, and 2) does the data contribute to our knowledge base regarding student achievement? Results of this and previous studies of GLA pilots demonstrate that the answer to these two questions is yes and is demonstrated by the following key findings:

- The degree of jurisdiction participation in the 2006-07 pilot was much higher than expected. A participation rate of 33 % was expected; however, the data submitted represents 60% of schools.
- The error rate for data submission was low with only 2.2% of the files submitted having errors.
- Compared to the 2005-06 data, the 2006-07 data demonstrates similar results for the total cohort and for specific sub-groupings of GLA data. Patterns of data distribution observed in 2005-06 with 82,000 students were also observed in the 2006-07 data.
- The data analysis demonstrates many interesting relationships. For example:
  - o The large difference between Math 9 Provincial Achievement Test data and GLA continues to be evident.
  - o Significant variations are observed in GLA between student sub-groups. The GLA at a Glance (Table 36) illustrates this.
  - o A much higher percentage of students coded as gifted are assessed above grade level in Math than in English Language Arts or French Language Arts.

- When comparing foreign-born and Canadian-born students, both groups of students perform similarly in Mathematics but in English Language Arts, Canadian-born students are at an advantage.
- Although a serendipitous finding, there is a disproportionate ratio of male: female severely coded students. There are nearly four times as many males as females coded as severely disabled.
- When comparing GLA and PAT data, females outperform males in GLA to a statistically significant degree in both subjects in nearly all enrolled grades. The reverse is seen on the Math PAT results with males outperforming females to a statistically significant degree. In English Language Arts, females are outperforming males on the PATs.
- A greater proportion of high mobility students (i.e. those who have changed schools more frequently than other students) have a GLA below their enrolled grade level.
- When examining mean GLA compared to enrolled grade, interesting patterns emerge:
  - The relationship between enrolled grade and GLA for non-coded students is very close as expected and is generally aligned with PAT results.
  - The variance between enrolled grade and GLA tends to increase through the elementary grades and peaks at grade 6 and grade 9 for students with a severe disability.
  - A similar pattern is seen for students with a mild/moderate disability, but the peak in grade nine is absent.
  - Gifted students are more likely to have a GLA above enrolled grade in Mathematics than in Language Arts.
  - Foreign-born and Canadian-born ESL students' GLA distributions are much closer together this year than was seen in the 2005-06 data.
  - Foreign-born ESL students seem to have a GLA on par with their enrolled grade in Mathematics up until Grade 5. In English Language Arts the two measures diverge as early as Grade 2.
- The age effect[10] is apparent in English Language Arts in Grades 1 through 5. After Grade 5, the age effect tapers off and is no longer apparent. This relationship is more pronounced in the 2006-07 GLA data than in 2005-06, possibly due to the larger number of students in the 2006-07 data.
- There are moderate strength correlations between PATs and GLA (Grades 3, 6 and 9). This demonstrates a reasonable degree of concurrent validity of the GLA data.
- Using GLA and PAT information, GLA can provide important information for students that would not otherwise be available for students in grades not tested by PATs.

## Future Analysis

As noted in the Limitations section of this report, given the pilot nature of the data presented, the findings must be considered preliminary and can provide only tentative conclusions regarding levels of student achievement and factors that affect achievement for specific student cohorts.

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[10] Age effect is defined as older students in a grade tending to have higher average test scores than the younger students in that same grade when measured by the z-score of average PAT results for each birth month group (Alberta Learning, 2001).

Nevertheless, this report points to a number of potential research questions that may require further analysis as GLA reporting becomes more confirmatory as full implementation is attained in the 2007-08 school year. Among the questions that may require investigation are:

- Does the grade 9 PAT in mathematics or the GLA for mathematics 9 represent the best predictive validity for subsequent high school math achievement?
- What are the reasons for classroom-based assessment providing higher marks for female vs. male students in mathematics contradictory to PAT marks?
- Why are gifted students more likely to have a GLA above their enrolled grade in mathematics than in Language Arts?
- Why is the proportion of male students coded with a severe disability so much higher than female students?
- What strategies might be most effective in offsetting the negative effect of mobility on student achievement?
- What pedagogical adaptations might be helpful in mitigating the age effect in the early grades?

In addition, in future years the 2006 census data will be available for analysis. At that time, the census data will be compared to the 2007-08 GLA data to provide an indication of the extent to which variables external to the school influences student achievement. To create the most accurate comparison of the census data and the GLA data, the census data will be broken down by enrolled students' postal code.

The organization of census data from 2001 is largely the same as that from 2006 with the main difference being Mother's level of education. In 2001, the variable was Mother's years of education. In 2006, the variable is now Mother's level of education.

Once data is available, the following analysis will be done:
- Jurisdiction by Mother's level of education
- Jurisdiction by Avg. family income/LICO
- Jurisdiction by rent/own

The SES variables will then be compared to GLA to see if any patterns emerge. The following tables will show these results:
- GLA by Mother's level of education
- GLA by avg. family income/LICO
- GLA by rent/own

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